COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

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The Cleveland Meeting

MUCH thinking and some talking is being done these last days of September on the question of whether to go to Cleveland for the gathering of the clans on Oct. 2, and if to go, what to do. Until the gavel falls for the first meeting no one can say how representative the operators' side may be, but as the days pass it seems as if the tide is turning toward participation.

The meeting has two announced purposes—to set up a committee of inquiry to make report at a later date on the best, or a better, method of negotiating wage scales in the bituminous-coal industry and to arrange for negotiations next January looking toward a contract between the United Mine Workers and the operators of union mines to become effective on April 1 next. Necessity for the committee or commission of inquiry seemingly has passed with the provision for a commission of broader power and jurisdiction by Congress. Collection of the same data and hearings on the same general topics by two bodies would be a needless duplication of expense. But a study and report by a group from the main body that may assemble at Cleveland, a study and report on the very important question of future relationships between the operators and miners is something that might be accepted with better grace and be more effective than if the congressional commission should attempt the same thing.

Left to their own devices the operators and miners may not succeed in bringing back that time-honored method of wage settlements in time to forestall a strike in April, 1923. In view of the history of the past year, it is quite possible that the Cleveland meeting and such successors as it may have will be sterile of results. So thoroughly ingrained is the theory and practice of collective bargaining in the soft-coal industry, however, that if peaceful effective relations are not restored this winter, they will be one, two or three years hence. Barring outside interference, the bituminous-coal industry will in the course of time work around to sounder methods of handling its relations with labor. The schisms of recent months will heal.

The industry is not to be left to its own devices, however. The country is in no mood to put up with turmoil year after year, its coal supply threatened and curtailed, prices fluctuating wildly the meanwhile. The war and post-war relations of labor and capital have been such as to produce a definite urge on the part of the public for the initiation of steps to forestall and prevent these periodic upheavals in the coal industry. The congressional coal commission is primarily for that purpose. It is only to be expected that if the coal operators and the miners' union are not able at once to demonstrate their willingness and ability to get together on a sound, sensible basis, then the government will be compelled to step in. Which, being interpreted, means that if the industry cannot satisfy as to its ability to restore collective bargaining in its true full sense, then we will see imposed something in the form of a national coal labor board.

Cleveland therefore presents an opportunity. The miners' union, which does not want the government to settle its wages under such a scheme, must recede from its position of extreme arrogance and power; the several groups of operators must merge their interests and overcome their many differences and the two sides must convince the public and the congressional commission that they are capable of intelligent self-government if they hope to be left to govern themselves.

There are many who think that the day has passed when the country may be left at the mercy of a nationally organized union of miners and another of operators, who feel that some governmental check must be placed on the industry. The federal commission may make such a recommendation. Whether or not that follows, the need is as great for the organization on a national basis of the operators who deal with union labor. The avowed purposes of the Cleveland meeting cannot be attained unless the operators are unionized. Not having accomplished that in advance, such may be a result of the meetings next week.

On the Use of Weapons

CONGRESS has put in the hands of the administrative branch of our national government a weapon to hold over the coal industry. This weapon is the Coal Control Act that provides a method for punishing those who charge for their coal more than some price which an officer of the federal government may decide is just or reasonable. This legislation is predicated on the theory that the country is short of coal and that a high market is impending. A great many consumers are facing short rations of fuel. Generally speaking those who burn coal are in no wise responsible for the present condition of shortage, yet under the circumstances they will be called upon to pay the cost, and then some, of the strife that produced the shortage. The control of prices, whether by state or nation, is held to be justified on the ground that high prices will not, under the circumstances obtaining in either the anthracite or bituminous coal fields, operate to produce an added supply. Lack of men and mines in the hard-coal region and lack of transportation from the soft-coal areas act as a brake on the law of supply and demand. Beyond a certain figure, which is not so very high in either instance, doubling or trebling of price brings forth no more coal. General appreciation of these simple and established facts will tend to popularize price control by government.

It was an axiom in the olden days of two-gun men out West that he who reached for his six-shooter and did not shoot as he drew was not a dangerous man. Our government has not only pulled its gun but has cocked and aimed it at the coal man, but instead of

firing has asked him to come along peacefully. There are those who draw the inference that the shells are blanks and that this is but a gesture. A great many are ready and determined "to stand on their constitutional rights" and defy the Fuel Control Act. It will be unfortunate indeed if matters be allowed to come to such a pass that the Federal Fuel Distributor and the Interstate Commerce Commission are jockeyed into a position where they attempt to set a price and discriminate in car supply to force its acceptance, and the operators retaliate with legal proceedings to prevent such discrimination—unfortunate on the one hand because the law is unfortunate and on the other hand because of the extremely bad odor that will adhere to the coal trade for fighting it. Bear in mind that if there is a pinch in coal prices this fall it will first appear in the last half of October, and that the country is full of congressmen campaigning for re-election in November. If the present law isn't effective, more drastic action can be promised if a constituency appears to make the demand.

There is a way, of course, to prevent all this prospective trouble. Just make the railroads haul all the coal the mines can produce and tell the anthracite-burning public to buy one ton of soft coal or coke and two tons of hard coal where three tons of hard coal are nominally required.

Real Men, These

DOWN at Marion, Ill., the seat of "bloody" Williamson County, a grand jury of 23 men has finished its investigation of the Herrin massacre of nineteen non-union miners on June 22. It did a masterly job of it. No less than 214 men stand indicted for "conspiracy and rioting," "conspiracy to commit murder," "assault to murder" and 44 of them for "murder." It was a mighty mob of bloodthirsty men who, unhampered by law or any enforcers thereof, encircled the strip pit of the Southern Illinois Coal Co., accepted the surrender of the non-union workers and guards therein and then shot and cut nearly half the captives to death, wounding many others. Nobody could hope that a grand jury three months later could learn who all of the men in the mob were. But indicting 214 of them was a masterly job.

When the grand jury was impaneled in August it began one of the most undesirable tasks imaginable. There they were, those twenty-three farmers, selected from among the non-mining residents of a county whose main industry is mining. It is a county where popular sentiment was such that a man either said he was against the prosecution or else he kept his mouth shut. Dark threats against prosecutors down there were not uttered idly. It was in "bloody" Williamson County. But as the jury took the case Judge Hartwell, of the Circuit Court, leaned across the rail of the jury box that momentous day and told them he knew them all and he knew they were real men ready to acquit themselves as such in the face of "influence," bribes and direst threats. They have done so. Their action and the language of their report to the court is sound evidence that there lives in "bloody" Williamson County an element worthy of the title "American."

The grand jury is to be commended not only for the fearless investigation it made but for the evident honesty of its effort to get at the truth and the whole truth. It minced no language in blaming a mining company for foolhardy action. It flatly said the ill-advised message of John L. Lewis, president of the United Mine Workers, telling the union miners of southern Illinois that the men in the strip mine were strikebreakers "and should be treated as such" was the spark that touched off the magazine of hate. It charged the miner sheriff of the county, a candidate for office, with a cowardice that was indulged for political gain and stripped state officers of the flimsy defence of their own failure to do their duty before the massacre took place. It gave the miners' union a much-soiled bill of health and otherwise displayed its impartiality and stalwartness.

The grand jury's work may be finished. It has named 214 men who may be guilty. The case now goes to the courts for trial. It remains to be seen whether a jury impaneled in the ordinary way in the solidly unionized county of Williamson can be as fearless and honest and impartial in the upholding of the arm of the law. It is by no means proved that government and justice and decency have regained command in "bloody" Williamson.

Keep Your Hand Close to the Work

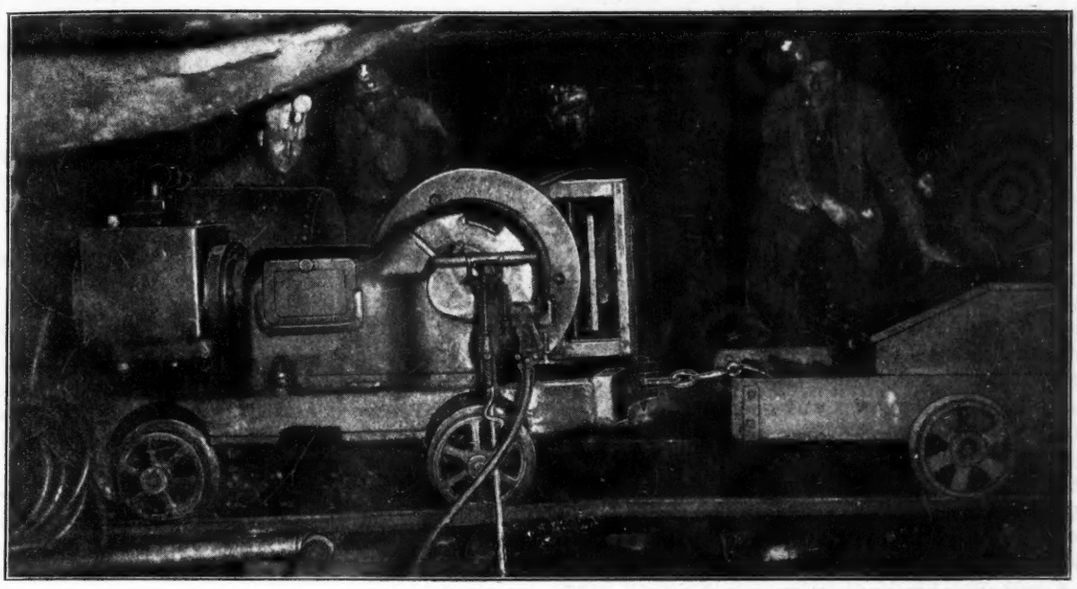
AN ARTICLE this week by Joseph A. Maguire gives an interesting description of the ways in which power is wasted. In fact it was the misuse of compressed air that made it disappear so suddenly from its former rôle as the main medium for power transmission at mines. It was too freely used to remove smoke, gas and even water. Lines were laid too carelessly; valves were left "with just a crack open" for air to escape, and the result was inevitable.

Of course there were other causes, line friction being among them. The lines were designed to provide certain machines with air and to do it at a certain location. As the pipes were extended and more machines were needed and used and more places had to be ventilated by valve cracking (for it seemed inevitable to use the air when it was so handy) and when, also, leaks became more frequent and troublesome, the main lines became inadequate, and it seemed too great an undertaking to dismantle the line, move the pipe forward and put new and larger pipe near the main compressor.

But losses due to leaks and cracked valves turned the tide definitely against compressed air. One way to avoid leaks as also line losses is to put the compressor near the work to be performed, driving it by electricity.

Such a compressor needs no attention, automatic regulation providing for its operation without raising excessive pressure or using power wastefully. When only a few men are served by a compressor they will be more likely to see to it that the air is not wasted, though they may be somewhat careless as to what happens when none of the men is using his drill. Where a big compressor is used the men are too far apart to watch wasteful users of air, and so the responsibility, being largely spread, is almost entirely unfelt.

Small units also provide for the shutting down at off-hours of all the compressors save the one near the pump or other machine that must work during the otherwise idle period. With the compressor portable the hand is kept near the work and the air power is always under control. When generated at the mouth of the mine the chances are that it will be largely wasted in inefficient ventilation and leakage.



More Power Often Wasted by Leaky Pipes and Cracked Valves Than Would Run a Compressed-Air System

In Off-Shift Operation Leakage Consumes Unusually Large Proportion of Power—Partial Change from Air to Electricity May Merely Add Cost of Latter to Former Air Cost

By Joseph A. Maguire
Dunmore, Pa.

COMPRESSED air plays an important part in the production of coal, particularly anthracite, being largely used to operate inside hoists, pumps and drills. Electrification of hoists and pumps has tended to reduce the use of this medium of power transmission, but this reduction is being offset to a certain extent by the increasing use of air drills. The efficiency of an air system is of the utmost importance, not only on account of the operating expense of such a system but also because the production of coal and its total cost per ton is greatly affected by the efficiency of the air system.

It may be beneficial, therefore, to point out some of the common ways in which this efficiency is lowered. The average mine using compressed air contains a network of distributing pipes, the result of various extensions, generally made in a hurry, with little or no regard for proper sizes, drainage and the like. This network is an ever-growing one, as lines are not generally taken out when the work in a section is stopped.

These pipes soon cause losses, for leaks develop either at the joints, where the valve packing gives out, or at points where the roof falls and breaks the pipe. It is not uncommon to find that this method of making extensions to the piping system causes an excessive pressure drop in the pipe lines. In time this results in such low pressure being maintained that neither hoists nor drills can operate effectively. This pressure drop sometimes occurs at the shaft but more often in sections of the mine where lines, put in originally to supply one or two hoists, have been converted, in part at least, into mains. It is not uncommon to find hoists that are barely able to pull a trip at more than a snail's pace, or to find these machines waiting until the demand eases up and the pressure increases, before being able to operate at all. Frequently this can be remedied by putting in a few hundred feet of larger pipe or sometimes by merely installing traps.

Loss in energy and pressure due to leaks is likely to be heavy unless pains are taken to keep leakage at a minimum. It is not always easy to cut good threads upon present-day pipe. The dies employed do not get as careful usage as could be wished, making it a still more difficult matter to get tight joints. For these reasons it would pay handsomely to furnish the mechanics doing this work with white or red lead or some other pipe compound. The practice of running air pipes along the bottom or on the mine floor is another prolific source of leakage, particularly when the pipe is rela-

NOTE.—The frontispiece shows one way to circumvent leaks by putting the compressor near the work to be performed, driving it by electricity. This photograph of a compressor and air drill was taken at Canaanville, Ohio, in the mine of the Canaan Coal Co. The many men present are there because they know that a photographer likes to get "action" in the picture. The compressor is quite capable of running without attention.

tively small. In this location it is subjected to undue stresses as the result of men and mules stepping on it and from various other causes. Such stresses cause leaks. A saving in maintenance and in operating power will be obtained by keeping the pipes off the bottom.

When it is necessary to maintain pressure on the piping system continually, as for the operation of pumps, leaks become of serious importance. As a rule 24-hour operation is required for only one or two pumps or to supply a contractor in one section, but service is nevertheless maintained on the entire system. This means that the losses from leaks on the entire system are going on continually.

Just what this amounts to may be appreciated from tests made to determine these losses. One mine plant tested consisted of two 1,700-cu.ft. cross-compound non-condensing steam-driven compressors supplying hoists, pumps and drills. One pump was operated by air continually and for this purpose pressure was maintained on the entire system at all times. The results obtained from this test follow:

Average flow of air from compressors during working periods, 1,950 cu.ft. per minute; average horsepower input, 340; flow of compressed air to supply leaks, 950 cu.ft. per minute; horsepower to supply leaks, 157; total power cost per year to supply compressed air, $18,200; power cost per year to supply leaks, $12,400; power cost to supply mechanical apparatus, $5,800.

Thus because pressure was maintained on the lines continually, the losses in energy from leaks were twice as great as the energy actually furnished to the hoists and other mechanical apparatus.

Loss by Reason of Leaks Is Great

Another installation which was subject to test maintained pressure 24 hours a day to supply a small dip pump of 200-gallons capacity operating against a 30-ft. head. With nothing operating off the air system but this pump, the input to the air compressor was 105 hp. The magnitude of the loss incurred by reason of leaks can readily be appreciated when it is realized that 3 hp. would be ample to pump the water handled.

These two instances are cited from a number of similar tests. It is believed that they cover average installations, neither better nor worse than hundreds of others.

Another large source of loss is the use of compressed air to ventilate chambers. It is much easier to crack an air valve in a chamber before going home than to stop and put up brattice cloth. Many foremen seem to wink at this practice even when the ventilation in the section is beyond criticism and in spite of strict orders prohibiting it. This probably is because they do not realize the cost of ventilating in this manner. This practice, however, results in more than the loss of power to supply the air. It springs primarily from using compressed air to blow out powder smoke, but gradually grows to ventilating chambers day and night, until together with the leaks it overloads the compressor plant until the pressure gets so low that nothing will operate effectively. When this occurs the miners who are saving themselves trouble with brattice cloth by the use of air are the first to go home because the pressure is low.

To cite one instance of this, I once investigated a mine where trouble was being experienced in maintaining pressure. A 400-cu.ft. compressor had operated a few small air hoists and managed to maintain a reasonable pressure. These hoists were electrified and some air drills installed. It was soon necessary to procure a larger compressor and a 600-cu.ft. machine was put in place. In spite of this the pressure continued low. An investigation showed that leaks and the use of compressed air for ventilation was responsible for this condition. In extending the piping into the chambers many leaks had resulted and the practice of ventilating with compressed air had started. The 600-cu.ft. compressor could maintain only 75-lb. pressure even though no machines were operating. Air-flow measurements showed that the compressor worked properly but was overloaded.

Electrification Is Often Disappointing

Leakage and valve cracking have been the cause of much disappointment when air hoists and similar apparatus have been electrified. Estimates have been made showing that large economies should be realizable from the electrification of air-actuated equipment. After electrifying the hoists and other machines it frequently has been found that the compressors consumed as much power as before.

As a case in point, one mine operated two 1,000-cu.ft. steam-driven compressors. These machines were rather old, not in the best of repair and consumed about 60 lb. of steam per horsepower-hour. From these two compressors a number of hoists and pumps were operated. It was estimated that by the expenditure of $50,000 an economy of $18,000 per year could be obtained. After electrification one compressor was shut down and the other operated slowly to supply a few air drills. After a few months the operation of the compressors increased and in a relatively short time both were pounding away at full speed during the day and one at night and on Sundays. Apparently not only was the $18,000 economy not obtained but the power costs were actually increased $12,000 per year.

Careless Pipe Laying Causes Many Leaks

Called to investigate this condition, I found the original estimates conservative and the installations properly executed. What had actually happened was that a number of air drills had been added and in running the connections to the chambers extremely careless piping had been done and old cast-off valves had been used. In addition compressed-air ventilation had gotten a foothold to such an extent that the only reason for operating the compressors other than during working hours was for the purpose of ventilation.

The pipes accordingly were put in proper shape, one compressor was dismantled and the engineer was required to operate the other only during working periods. Later, however, this ruling had to be modified in order to provide for development work. To prevent waste valves were installed on each main distribution pipe, so that all sections other than the one in the territory in which work was going forward were shut off when the "all-over" whistle blew.

In electrification of air-actuated apparatus on the basis of economy it should be realized that for the reasons stated the power actually used to operate the mechanical apparatus may be, and frequently is, a minor portion of the energy consumed in compressing air. If compressed air is to be entirely eliminated this can be disregarded, but if it is to be supplied for any purpose after the electrification of pumps and hoists it should be considered a part of the electrical program

to overhaul and put in good condition the air pipes that are to remain in service and to dismantle all piping not absolutely necessary.

Another common practice in the utilization of steam-driven compressors which is highly wasteful is to regulate their operation by hand. The regulators that automatically maintain the desired pressure either are overlooked when installing the compressors or are allowed to get out of repair to such a point that the compressors are operated by hand. Theoretically, when no governor is used the engineer adjusts the speed of the compressor to meet changing load conditions. Actually he sets the hand throttle to meet the maximum requirements and allows the safety valve to regulate the pressure. I know no easier method of wasting money.

Efficient compressors of course are essential to economical operation. Many machines are in use which, though sturdy and rugged, are of inefficient design. They were purchased when the low price of fuel at the mines did not appear to justify the expenditure necessary for more efficient types. They have, in the majority of cases, served long and well and under prevailing fuel prices can be profitably retired from active service.

POWER COSTS PER YEAR

Simple steam-driven compressor	$13,950
Compound condensing steam-driven compressor	6,440
Electrically-driven machine current costing ¾c. per kw.-hr.	4,985
Electric machine current costing 1c. per kw.-hr.	6,640

In choosing between steam and electricity as a motive power for compressors consideration should be given to a number of factors other than the price of steam or electric energy. No hard and fast rules govern, for what may be the more economical drive in one case may easily be the more expensive one in another. Some idea of the operating power costs of simple steam, compound non-condensing steam and electrically-driven compressors can be obtained from the accompanying figures, taken from actual installations and corrected to a common basis of operating conditions. This base is as follows: The machine is assumed to furnish 900 cu.ft. of air per minute for 275 working days of 8 hours each per year and 400 cu.ft. per minute during the rest of the year; the cost of steam is taken as being 30c. per 1,000 lb., whereas electricity is assumed to cost ¾c. per kilowatt-hour in one case and 1c. per kilowatt-hour in the other.

Coal Flotation and Briquetting of Float Make Rapid Strides in Many Countries

AT THE annual meeting of the Minerals Separation, Ltd., of London, England, the chairman, Francis L. Gibbs, reported that the company was compressing coal with 50 per cent of water and about a third the usual quantity of binding material and producing a briquet containing only 4 or 5 per cent of water, the water expressed coming out in clear jets without a particle of coal in it. The coal being thus briquetted is that of the Powell Duffryn Steam Coal Co., of Wales.

The statements that follow are taken from a recent annual report of the chairman. The briquets made by the process, which will be known as "Minseps," come out in a compact shape with a more or less hard surface and become in a few hours so strong that they can be thrown about without breaking. The briquets as marketed "can be made to contain only about 3 per cent of ash and 3 per cent of moisture." Thus by this process the cost of drying and driers is said to be saved as well as the cost of pugmills, and the product, having an unusually small quantity of binder, causes less smoke than other briquets. Furthermore, the fuel does not open up in the fire. It is purposed to manufacture 2,000 tons of this fuel daily at the Powell Duffryn plant. Some of the fuel already has been tried on a railroad in Wales having steep gradients, and it has given great satisfaction.

Another briquetting plant is to be installed at Ashington, to be run in connection with the flotation plant in operation at the mines of the Ashington Coal Co. Here tests will be made on the flotation of coal and the briquetting of coals and "brasses."

The work at the Skinningrove Iron Co.'s plant has been delayed by the depression in the iron and steel industry; nevertheless progress has been made in the construction of a plant which will treat 600 tons every 24 hours.

A plant of like size has been erected and operated at the Oughterside Collieries in Cumberland and is said to give a coke far superior to that produced before. At Low Laithes Colliery, in Yorkshire, a plant with a daily capacity of 250 tons is in course of erection and another will be built by the Team Byproducts Coke Co.

Much work has been done in an attempt to coke coals which are rated as semi-coking, and several large-scale tests have been made. This problem is not yet solved completely, for, although part of the charge of coal after treatment produces excellent coke, part does not. The solution of the problem of coking the more resistant material appears likely to be found either in the adjustment of the temperature or in the substitution of a different form of coke oven from that which is generally used, one that will suit the particular product which has to be coked.

At Noeux-les-Mines, in France, a plant is being installed with a capacity of 1,000 tons. This plant should be in operation early next year. A briquetting plant also will be erected, owned partly by the coal company and partly by the Minérals et Métaux, the representatives in France of the Minerals Separation, Ltd.

In Spain the Aprovechamiento Residuous Minerales Sociedad Anónima, a subsidiary of the Minerals Separation Co., purchased the coal plants Mariana, La Modesta, Maria Luisa and Baltasara, the Mariana plant being put into commercial operation early in April. The high ash content of the coal gave some difficulty, but this has been overcome and the product now meets requirements. This plant, in common with all other coal plants in Asturiana, except the Ujo plant, has been shut down since May 16 on account of a general strike. However, construction work has continued.

The Pena Rubia plant continued its production until shut down by the strike, producing a product of good coking quality. At Ujo, after considerable delay a 600-ton plant was put into commercial operation at the mines of Hullera Española and the latest advices indicate that from the current washery slimes a minimum production of 200 tons a day of clean coal may be expected. The product has an ash content below the expected figure. Within a short time this plant will be running at its full capacity.

In China a plant is to be erected for the Chinese Engineering & Mining Co., Ltd. It will have a capacity to treat 250 tons every 24 hours. The plants in Belgium, Germany, Australia, South Africa, India and Chili have not arrived at stages of development which would justify reference to them in these columns.

Reports and Investigations State Geological Surveys and Mining Bureaus

Coal Reserves in Somerset County, Pa.

By John F. Reese

SOMERSET COUNTY, Pennsylvania, contains nine coal beds now of economic interest. In order of present importance as shipping coals these are the Upper Kittanning, Lower Kittanning, Upper Freeport, Redstone, Pittsburgh, Lower Freeport, Clarion, Sewickley and Brookville.

The extensive mining development and outcrop of the Upper Kittanning bed and a fair number of core-drill records have furnished many measurements of its thickness and evidence of its persistency. This makes possible a fairly accurate estimate of the quantity of coal in this bed. In the Wellersburg field and south of Meyersdale, where data are meagre, an average thickness of 30 in. has been assumed. This bed is thickest in Jenner and Conemaugh townships, where it ranges from 38 to 87 in. The Upper Kittanning is the most persistent bed, contains the greatest coal reserve, and is the largest producer within the county, yielding more than 4,100,000 tons annually.

A fair amount of information as to the thickness and persistency of the Lower Kittanning bed throughout the northern half of the county is available. In the southern part data are meagre except where coal is mined. Little is known as to the extent and thickness of the beds over large areas, and a general average based on thicknesses in surrounding areas was used in computing the quantity present.

The extensive outcrop of the Upper Freeport bed throughout the county and the mines in various localities furnish enough measurements to make possible a fairly accurate estimate of quantity. This coal attains its best development in Jenner, Conemaugh, Lincoln, Somerset and Quemahoning townships with a thickness range of 34 to 71 in. As no information is available as to the extent and thickness of the Upper Freeport coal under large areas in the townships south of Somerset, a general average based on thicknesses in surrounding areas was used. The percentage of this bed that can be recovered is governed by the sequence in which the Upper and Lower Freeport coals are mined. If the Lower Freeport bed is worked first and pillars are drawn, the overlying rocks will cave and break the Upper Freeport bed, thereby causing a partial and in many places complete loss of that coal.

An accurate estimate of the quantity of coal in the Redstone bed is made possible by many measurements at mines and outcrop. The mines are in Summit and Elk Lick townships. The Platt coal of the Berlin area has been correlated as the Redstone coal, but as little is known of its extent and thickness it is not included in these reserves. A conservative percentage of recovery has been used in computing the recoverable tonnage, because most of the underlying Pittsburgh coal has been mined and the pillars drawn, causing the intervening rocks to cave and break this bed, making it difficult and costly to mine.

The extensive development at outcrop of the Pittsburgh bed furnish much information as to its extent and thickness. Pittsburgh coal has been mined so many years in Summit and Elk Lick townships that it is practically exhausted. In Southampton, Brothers Valley and Jenner townships this coal has been developed in recent years. Brothers Valley township contains the largest reserve.

The No. 2 Price coal of the Berlin area in Brothers Valley township has been correlated as the Pittsburgh coal and is here computed as such. From drill-hole records and outcrop it has been possible to define fairly accurately the extent of this bed. The area as defined will be subject to correction when more information is available from future prospecting and development.

A fair amount of information is available as to the extent and thickness of the Lower Freeport coal. It is thickest in Somerset and Quemahoning townships, and because of its exceptionally fine quality in the vicinity of Friedens it is in great demand as a smithing coal. As this bed is extremely variable in thickness and persistency, it has been considered as a reserve only in areas contiguous to mines or to drillholes that prove it to be of workable thickness. A low percentage of recovery has been assumed also because the bed is so irregular.

The Clarion coal has been computed as of economic interest in six townships, namely, Addison, Black, Milford, Paint, Somerset, and Upper Turkey Foot. Little is known of its thickness and extent, and only areas surrounding developed or proven ground have been computed. Future prospecting may enlarge these areas, but information is meager at the present time. The Clarion coal is thickest in Black township, ranging from 40 to 58 in. This coal is extremely variable and is broken by partings. Therefore a low recoverable percentage was used in these computations.

The No. 1 Berlin coal in Brothers Valley township has been correlated as the Sewickley coal, and no quantity has been computed as such here. From drill-hole records and outcrop it has been possible to define with fair accuracy the extent of this bed. The area as defined is subject to correction when future prospecting and developments furnish more information. The Sewickley coal is mined only in Brothers Valley township in the vicinity of Pine Hill, where it averages 44 in. thick.

Brookville coal is considered of economic interest in six townships, namely, Black, Brothers Valley, Elk Lick, Milford, Somerset and Summit. Data are meager as to its thickness and extent, and it has been considered as existing only in areas contiguous to localities where mined. This bed is 30 to 36 in. thick in Black and Somerset townships.

The result of computing the coal reserves within this area, based on the latest maps, engineering data and methods, is shown in the accompanying table.

COAL RESERVES IN SOMERSET COUNTY*

Coal Beds	(In Net Tons) Original Dep sit	Mined Out	Recoverable
Sewickley	8,700,000	3,600,000	3,400,000
Redstone	15,400,000	7,400,000	5,400,000
Pittsburgh	51,000,000	29,504,000	16,100,000
U. Freeport	866,600,000	7,380,000	525,700,000
L. Freeport	370,100,000	1,540,000	219,600,000
U. Kittanning	3,086,500,000	84,050,000	2,188,500,000
L. Kittanning	1,500,200,000	52,400,000	910,700,000
Clarion	89,800,000	750,000	54,600,000
Brookville	103,500,000	760,000	62,900,000
Total	6,091,800,000	187,384,000	3,986,900,000

*The area of Somerset County is 949.4 square miles.

Shaking Chutes, Swung from Roof or Resting on Rollers Meet Loading and Gathering Problems in Low Coal

Chutes Made of Heavy Galvanized Iron in Ten-Foot Sections and Often Over Three Hundred Feet Long Receive Impulse from a Machine Sixty to Ninety Times per Minute—Troughs Deliver Timber

By A. Gerke
Waldenburg, Silesia, Germany

MANY considerations influence the choice of a method of mining coal—economy, protection of the workman, preservation of the surface and neighboring seams and, among the others, the provision for conveying the coal when mined. No difficulty is experienced in the conveyance of the coal when the seams to be excavated are of such thickness and of such a moderate gradient that cars can be taken readily to the working faces. Nor is the problem difficult where the coal will readily slide to the gangway, as, for instance, when the gradient is 30 deg. or more. The problem is found where the inclination is oversteep for cars and not steep enough to move the coal by gravity. In such cases to avoid unnecessary shoveling of the coal the length of the "bords" should not exceed 33 to 40 ft.*

It follows, therefore, that in the development of the mine an unusual number of gangways will have to be driven, and in all of these rock will have to be shot down or lifted if the seam is not thick enough to provide headway for the mine equipment. Moreover, the driving of such a multitude of gangways would not only be expensive but the maintenance also, and, furthermore, their many roof falls would interfere with operating efficiency. Such gangways would have to be kept standing for a long time.

It is also true that their ventilation would be both difficult and expensive. In mines generating firedamp

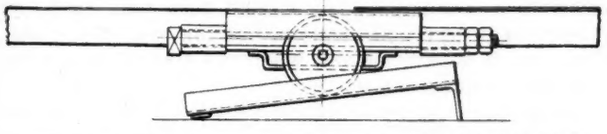


FIG. 1—ROLLER UNDER JOINT AT TROUGH SECTIONS
The roller runs on an incline, so that after it has gone forward under the impulse of the motor or engine it runs backward and so provides for the return of the trough. Note the bolt passing through the rams-horn curls of the attachment plates of the trough sections.

another objection would be that it would be no easy matter to keep these many roadways free of gas. Supervision would require several men because of the lack of concentration of the operating faces. Above all, the work would be excessively prodigal of labor, because the work would be done under many disadvantages.

As these many drawbacks are even more troublesome where the coal is thin, and as low seams of coal are becoming ever increasingly operated, no efforts have been spared to devise some method of replacing such a system by another more effective.

That this difficulty has been recognized in America is evident from an article published in *Coal Age* in 1916, Vol. IX p. 1,044, entitled "Scraper Mining for Low Veins," which describes an installation in the mines of the Lehigh Valley Coal Co. This, it is true, is used with the room-and-pillar system of mining. It provides for the use of a scraper pulled to and fro by a hoist located in the gangway. The width of the working

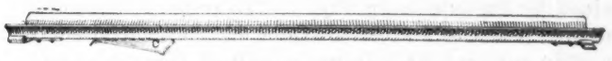


FIG. 2—SINGLE SECTION OF THE TROUGH CHUTE
The rams-horn curls may be seen at either end of the section. These provide for the retention of the end of one section against the end of the next despite the pushes and tugs caused by the frequent forward and backward movements of the trough.

places usually is 24 ft. and their length about 50 yd. Successful use of this method has been made at the Seneca and Maltby mines, not to mention others.

In Europe troughs of galvanized iron are used to bring coal from the working faces to the gangway, these being either hung from the timbers in the bord or supported on rollers. The trough, which has an ultimate length of from 200 to 330 ft., is pushed to and fro 60 to 90 times per minute by an electric motor or one driven by compressed air. The impulses cause the coal to slide down the trough.

When the trough, suspended by hangers or sustained by rollers, is pushed forward the particles and lumps of coal go with it. When the motion of the trough is arrested at the end of its stroke the coal, not being attached to it, continues to go forward, retarded slightly by the friction of the trough, which trough is now traveling backward. When this movement ends the trough again begins to go forward, aiding in the advance of the coal. The trough, having gone to full range of its motion, again starts forward, causing the coal to continue on its way. In this manner the coal is moved toward the loading point, to which it may be borne with speed, receiving as it does 60 to 90 impulses per minute.

Fig. 1 shows a part of the trough on rollers and Fig. 2 a single unmounted trough. It will be seen that it

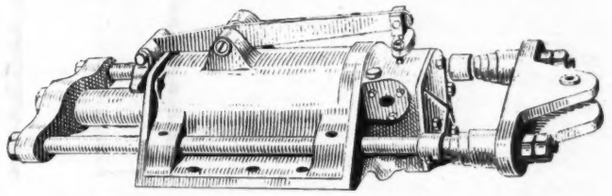


FIG. 3—ISOMETRIC DRAWING OF THE ENGINE
The trough may be reciprocated by an engine or motor. This compressed-air engine uses the air expansively and in only one direction—backward. Note the valve motion and the springs on the forward crosshead.

*Herr Gerke overlooks the many schemes of driving on a line between pitch and strike, of using a room hoist or two tracks with a retarding "gravity hoist," of loading the coal into a small "buggy" which is run on a grade nearly level and dumping the coal from the buggy into a full-sized mine car, and of using a trough and "bucking" the coal in the trough. He refers, later however, to another method, that of the scraper shovel. The English word "bord" is used here to express a roadway driven like a room for the obtaining of coal but unlike the room in that it is narrow and without a neck and so resembles a gangway or crosscut in plan rather than a room. See Figs. 6 and 7 in this article.—Editor.

has a flat bottom with flaring sides. The iron usually is $\frac{5}{32}$ in. thick, and the depth of the trough is $3\frac{5}{32}$ in. At the top the trough is, as a rule, 15 in. wide and at the bottom $11\frac{1}{2}$ in. Its weight is about $12\frac{3}{4}$ lb. per ft. Unit lengths of the trough are from 10 to 13 ft. long, but, as stated, when joined up these units may constitute a trough 330 ft. long, and sometimes the length is made even greater.

For transmitting the motion throughout the length of the chute a so-called "driving trough" is used which rests against brackets bolted to ends of adjacent trough sections, which brackets are curved into a sort of rams horn at their ends. These curling edges are fitted for the reception of bolts. The brackets therefore keep the troughs snugly in position.

Each 10- or 13-ft. length must be firmly joined to its neighbors on either end, as the reliability of the trough as a whole depends on this characteristic. Only a good joint can successfully sustain such severe and continuous concussions as those to which these joints are subjected. Yet it must be a joint that can be disconnected readily, and simple also, for it must not have too many parts that are likely to get loose.

Underneath the bearing trough two rollers are fitted, joined by an axle as in Fig. 1. To prevent them from cutting into the bottom a frame has been devised for them to run on. This frame is so built that the runway for the rollers is on a steep inclination, as shown in the same illustration.

The motion of the trough, as stated, is obtained from a motor, driven by compressed air or electricity or even by steam. The former source of power is preferred and for this reason is here described. The motor can either be placed under the trough and be attached to it directly through an iron rod or it can be located at the side and be propelled by a transmission as illustrated in Fig. 4. In Fig. 3 the cylinder has a piston rod which bears a crosshead with rods which pass outside the cylinder on either side and are connected on the opposite side by another crosshead. An iron rod or rope is connected to the front crosshead at one end and through a three-piece motion is connected with the trough (see Fig. 4). When compressed air from the pipe lines enters the cylinder of the motor, the piston and through it the three-piece motion is moved back, thus setting the trough in forward motion. When, however, the piston has advanced a prescribed distance the compressed air is shut off by a valve, but the piston continues to move forward by the expansion of the compressed air and by the inertia of the parts. Thus the trough is brought slowly to a standstill. The trough then falls back by gravity to its original position, but the coal still glides along and it is still moving when the trough makes its next forward movement.

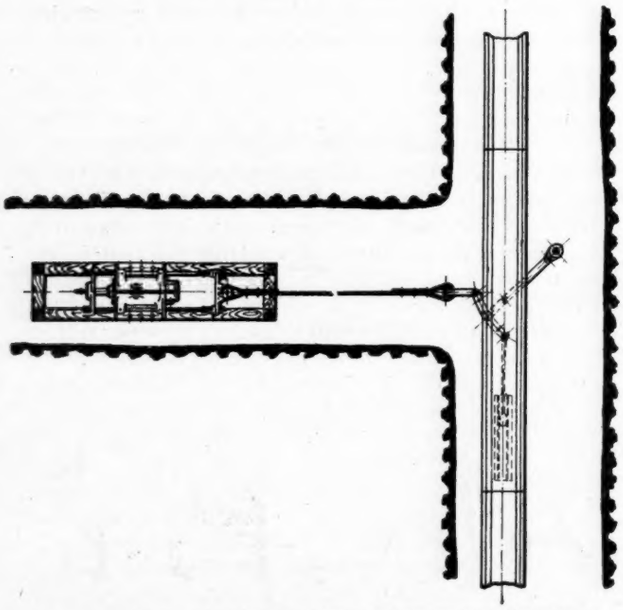


FIG. 4—PLAN OF ENGINE AND TROUGH CONNECTION

Here the engine is put on the side and not under the trough. The connection in this case is made through a rope, through a peculiar "motion" which converts movement in one direction to one at right angles.

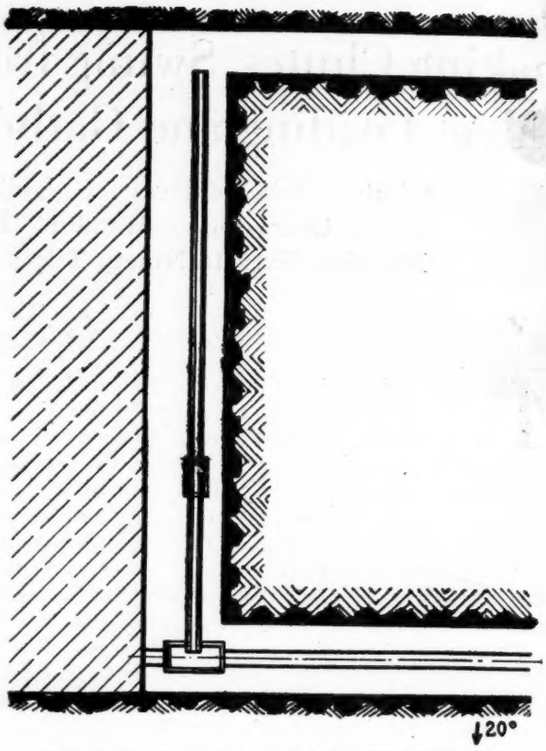


FIG. 5—WORKING A PILLAR OFF THE END

If the roof admits of this arrangement on a long pillar face, this gives maximum concentration of forces. Men can be placed 14 ft. apart. The method requires speedy excavation for safety, so the concentration while of advantage is also obligatory.

The motor is screwed solidly to a block of timber or a piece of channel iron and this is held immovably in place by pieces of wood or iron which are braced holes excavated in the bottom of the seam.

So much for the mechanism; now for the methods by which advantage may be taken of it. If the roof in the bord is strong and the seam not too thick, the troughway can be driven a length of perhaps 165 or 200 ft. It is carried, of course, in a straight line, the coal being removed either by working on the pillar or by driving cross bords.

Fig. 5 illustrates the former method of working, one which can be kept open only if the coal is removed with sufficient rapidity. If this precaution is observed the roof will then come down evenly as the work progresses. But if the face remains stationary for some time too much will be demanded of the roof. It will bear down on the face of the coal, thus breaking it off. To avoid this a large force of miners must be employed on the coal face. In fact there should be a hewer in every 14 ft. of face length. As the trough will carry 40 tons an hour it can remove the coal from more men than are thus indicated. This method concentrates the working

force much more effectively than is possible with room-and-pillar methods. Among the advantages are fewer haulageways to be maintained, fewer workmen to be employed, more efficiency from those employed, and fewer haulage plants and appliances needed.

Besides this method of working, which can, it is true, be employed only where the roof permits, others have been devised which may be used with advantage where the seams are thin. Fig. 6 shows pillar workings completely furnished with shaking chutes. In these cases the main bord is driven as far as the gallery above, whereupon cross bords are driven at 33- to 65-ft. distances on either side of the central bord. From these the pillars are removed by slabbing them on the ends, slabbing commencing in the upper cross bords before it is started in those lower down.

Fig. 7 shows another method of working. Here a single bord is driven between the bottom level and the top gangway so as to establish an air connection. In this bord a main trough is placed. The pillars on either side may be arranged 65 to 265 ft. wide, depending on the slope. In front of each of the pillars a trough is placed discharging into the trough in the main bord. In this method the coal is worked from the top downward following down the slope of the coal. This method is more simple than that in Fig. 6, and there are only two gangs of miners to be accommodated on the main trough. Supervision is also better than in the type of working shown in Fig. 6.

Timber may readily be transported where the troughs are installed provided the bord is driven through to the highest gallery, for it can be introduced in the trough at that point and the trough will move it down to the point desired. A man stationed at that point can take it off. Where, for any reason, this may be impossible a small windlass operated by compressed air or electricity may be placed in the highest point in the bord, and the timber then can be "snaked up" by this means. Another advantage of troughs is that they can be used where the coal is so thin that it would be necessary otherwise to shoot top or bottom to drive the bords. This saves much expenditure of money but also

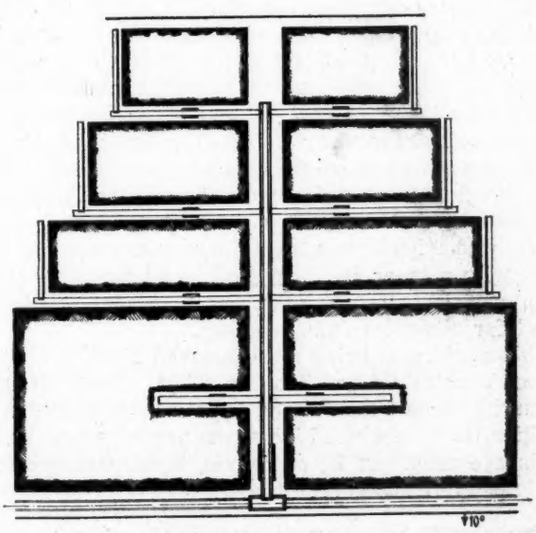


FIG. 6—MINING METHOD WITH CROSS BORDS AND TROUGHS AT PILLAR ENDS

The upper and further cross bords are driven first, and the pillars thus formed are drawn first. The bords nearest the main gangway are only just started. The one main trough receives coal from the troughs in the cross bords and these troughs in turn are fed by those at the pillar ends.

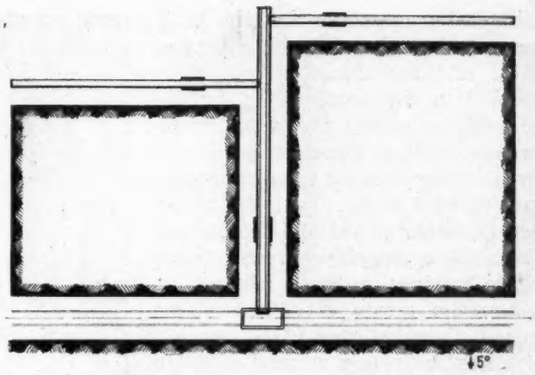


FIG. 7—A METHOD OF LONGWALL RETREATING

Here the trough is but lightly loaded as compared with the loading when the system shown in Fig. 6 is adopted.

reduces the time otherwise needed for development.

The advantages of reciprocating chutes in the working of a coal mine are first of all that the work can be expedited to a greater extent than by any other method. Few bords are needed and what there are need be driven only in coal, thereby saving much rock work. As the coal is carefully transported in the chutes its conveyance is marked by an absence of dust. As the troughs are strong and offer much resistance to wear and breakage, the plant deteriorates more slowly than almost any other form of equipment.

Other advantages are that the plants are quickly installed at little cost both for installation and operation. Such troughs can be used for the conveyance of rock, coal, ore and salt—in brief for all materials not disposed to adhere to the chutes. The troughs may be used where the ground is irregular and in surface workings as well as underground. The conveyance of coal by these means has today passed the experimental stage. The troughs have proved their value as a cheap medium of conveyance in a multitude of instances both below and above ground.

Small Steam Turbine for High-Temperature And High-Pressure Steam

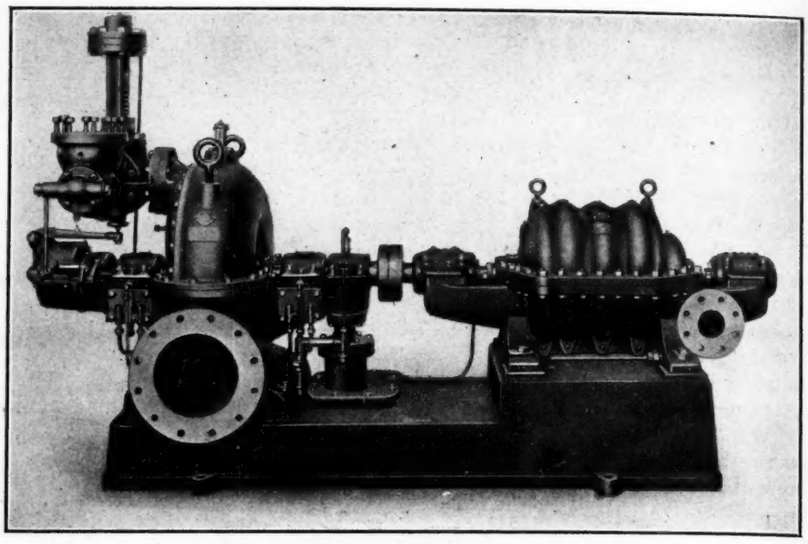
SMALL steam turbines, normally used for driving power-plant auxiliaries, such as exciters, circulating, hot-well and boiler-feed pumps, coal crushers, fans, stokers, etc., ordinarily receive, and should require, but little attention. They also should be able to use steam at high pressure and superheat, and for their size, should develop from the steam consumed the greatest possible quantity of work even though arrangements are made so that some of this steam subsequently may be utilized in feed-water heaters or for industrial purposes.

The velocity-stage turbine shown in the accompanying illustrations has been designed to meet these requirements. It is built in sizes up to 1,200 hp., and can be directly connected to high-head centrifugal pumps, blowers and compressors, to alternators and to small direct-current generators, or by means of speed-reducing gears, to alternators and direct-current generators of medium size, to large centrifugal pumps and blowers, to belt pulleys and rope sheaves, and in general to machinery operated at slow or moderate speed.

To adapt it for operation with steam of high pressure and superheat, the steam chest and nozzles are located

in the casing cover, so that the bearings are not subjected to high temperatures. As the steam is completely expanded in the nozzles, the turbine case contains steam at exhaust pressure only. For all steam temperatures above 450 deg. F. and for steam pressures above 210 lb. gage, the steam chest, governor valves and the casings of both the emergency-governor valve and the strainer are made of steel.

From the steam chest the steam expands through removable nozzles, which are accurately reamed so as to provide the ratio of expansion desired. Some of these nozzles are fitted with hand valves so that certain of them may be shut off or opened, as required by the load or steam conditions, thus permitting those remaining in service to work at the highest efficiency. The nozzle ring is easily removable.



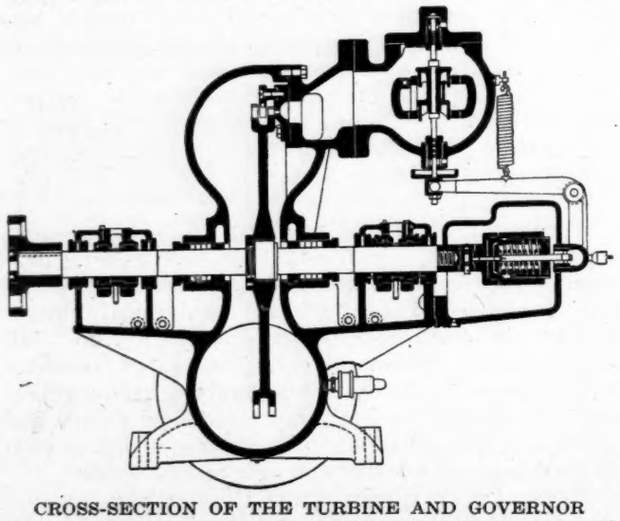
TURBINE CONNECTED DIRECTLY TO A PUMP

The simple high-speed rotary motion of both turbine and centrifugal pump naturally adapts them to direct connection to each other. The boiler-feeding unit of this type because of its reliability and freedom from water hammer and other ills is steadily gaining in favor.

The turbine wheel carries two or more rows of buckets, depending upon the speed and steam conditions prevailing. The buckets are drop-forged and are attached to the rim of the wheel by bulb shaped shanks in such a way that individual buckets can be removed without disturbing others. The steam discharged from the first row of buckets passes through guide vanes which direct it into the succeeding row. These guide vanes are held in removable steel segments attached to the nozzle plates, so that it is a comparatively simple matter to replace them should they become damaged or worn by long use with wet steam.

Admission of steam to the steam chest is controlled by a speed governor, which acts upon a double-seated valve. Where much steam must be handled, or the speed is high or where close regulation is desired, the governor is of the Jahns type, mounted on a vertical spindle. This is driven by the turbine shaft through a worm gear. A more simple type of governor, mounted directly upon the turbine shaft, can be used on turbines of small or medium size running at moderate speeds, or where a speed-reducing gear is used the governor may be mounted upon the slow-speed shaft.

This turbine is also equipped with a safety or emergency governor consisting of a small plunger set radially in the shaft which acts against a spiral spring. When a predetermined speed is exceeded, this plunger moves away from the shaft centre and strikes a small lever, thus tripping a mechanism which immediately closes the emergency valve. This emergency trip, or overspeed governor, is always mounted on the turbine shaft, and its action is entirely independent of the main speed governor. The valve trip is also independent of, and separate from, the one used for governing purposes.



CROSS-SECTION OF THE TURBINE AND GOVERNOR

A centrifugal governor on the turbine shaft actuates a balanced throttle valve that effectually controls the turbine speed.

As the turbine case is split horizontally its top half may be removed, giving access to the rotating elements. Upon removing the cover, the revolving parts can be lifted out.

As the steam is completely expanded in the nozzles, the turbine case must resist exhaust pressure only. An automatic sentinel valve, however, is provided to give warning of the excessive pressure to which the casing would be subjected in case a valve in the exhaust line were closed. There are no stuffing boxes or packings within the wheel case, and economy is not dependent in any way upon the maintenance of small clearances. To prevent leakage along the shaft where it penetrates the casing, metallic ring packing normally is used. For high speed under certain conditions of service, carbon-ring packing is employed.

The wheel itself is a steel forging mounted on the shaft with a taper fit. The shaft is of hammer-forged steel, sufficiently short and stiff to place its critical speed far above its running speed.

This machine is being manufactured by the De Laval Steam Turbine Co., of Trenton, N. J. It is intended primarily to meet the demand for a reliable and efficient auxiliary turbine where high steam pressures and superheats are used. It is, of course, equally satisfactory for less severe steam conditions.

THE SAFETY AND HEALTH CAMPAIGN conducted in the mining camps of Utah by Dr. A. L. Murray and C. A. Allen of the U. S. Bureau of Mines yielded such satisfactory results that they are being extended to other sections. Dr. Murray and Mr. Allen are at present conducting a similar campaign in the Coeur d'Alene district. This work is done in conjunction with the training in first aid.

Proper Handling, Care and Testing of Insulating Oils*

Special Mineral Oils of High Insulating Value, Free From Acid, Alkali and Moisture, Used—Danger from Absorption of Moisture and Formation of Sludge—Test Transformer-Oil Samples Twice a Year

NEARLY all transformers, compensators and oil switches that are used for lighting, power, etc., employ an insulating oil of some grade or other. In transformers the oil is used for insulating the windings and for the purpose of readily conveying the heat generated in the coils to the outside, where it may be radiated to the air.

In compensators and switches the oil is not only used for insulating purposes but to extinguish the arc formed on the opening or closing of contacts. It is important, therefore, that a proper grade of oil be used for each purpose. It is considered the best practice to purchase this oil from some standard electrical company that makes a specialty of handling and preparing such liquids.

Oils for this purpose must be of mineral origin, of high insulating value, free from acid, alkali and moisture. They also must be of relatively high flash and fire points, low congealing or freezing temperatures and must make a minimum quantity of sludge at the temperatures experienced when operating at full load for long periods. To obtain these properties great care must be taken during the manufacture of the oil to filter and dry it. The employment of an unprepared oil may cause serious damage to the apparatus in which it is used.

In storing and putting into service insulating oils, much care should be exercised. Oil of this kind generally is shipped to the purchaser in sealed tins or steel drums. Sometimes it is transported in the apparatus in which it is to be used. On receipt, if it is not to be put into immediate use, it should be stored in a dry wareroom. When steel drums are set on end moisture is likely to collect on their heads and this may be drawn into the drum by the breathing action induced by changes of temperature if even minute holes are present in the head. Consequently steel drums should always be laid on their sides with the bung down.

Oil for Replenishment May Be Bought in Tins

Oil for spare transformers or to make up for leakage therefrom should be purchased in tin cans, as these are more nearly airtight than barrels. The cost of holding a steel drum for a long period would more than offset the expense of the tin cans.

In transferring oil from container to apparatus care should be taken to prevent the entrance of moisture or foreign matter. Before opening a steel drum or tin all dirt should be wiped away from the mouth of the container, then the oil should be strained through several layers of clean dry cloth (to remove any foreign matter) into clean previously dried receptacles.

Oil cans or drums should not be opened in a temperature that is materially warmer than the oil. The temperature of room and oil should be nearly equal in order to prevent the inside of the drum from sweating.

Oil should never be transferred in damp or rainy weather without taking every precaution to exclude moisture. If the oil is received in good condition and is immediately placed in the apparatus it is reasonably certain that it is safe, but if it has been stored for some time the only sure way to ascertain its quality is by a dielectric test. This will be explained later.

In transferring oil the drums should not be opened until everything has been made ready for its transference, and no rubber hose should be used as the oil will decompose the rubber and the sulphur thus set free will attack the copper of the apparatus. When the equipment container has been filled to the proper height it should be sealed up as tightly as possible, making sure that all felt and other seals are properly in place.

Moisture and Sludge Spoil Insulating Oil

Apparatus containing oil seldom gives trouble, and for this reason it is likely to be neglected. It is a well-known fact that after oil has been in service for a long period it begins to change quality. Moisture will find its way in, sludge will begin to form, impairing the insulating qualities and stopping up the oil ducts. This in turn will either cause the insulation to break down or stop the oil passages, so that the transformer winding will run warmer than it should. It is therefore necessary to give such apparatus systematic inspection and to sample and test the oil regularly.

Apparatus of large capacity where the load is fluctuating through wide ranges should be inspected at least twice a year and samples of the oil taken and tested. A record of each inspection and the results of the test should be carefully kept. In this way it can be determined whether tests should be made more frequently.

In equipment other than transformers where the quantity of oil is small it is not necessary to test so often unless it is known that the apparatus is running overloaded. This may cause the oil to become too warm and result in deterioration. In switches and circuit breakers the oil deteriorates from a carbonizing effect rather than from the introduction of moisture. Lightning arresters usually will contain more moisture than other pieces of equipment because they are in contact with the electrolyte. This does not materially injure the oil for this purpose but when cleaning or restacking the arrester the oil should be passed through a filter or else new oil should be substituted.

It is desirable when taking a sample of oil for testing to obtain the poorest part of the contents of the container. This usually is located at the bottom as water. Sludge also being heavier than oil, will settle to this point. If this sample proves acceptable it is reasonable to assume that the rest of the oil is safe. If a bottom sample cannot be obtained the next best expedient is to obtain a test quantity from the top after the apparatus has been working and the oil has been thoroughly stirred. When drawing a sample from a test valve at the bottom of a container, caution should be observed not to include any of the oil that has been standing in

*Report of committee on "Proper Handling and Care of Insulating Oils" presented at meeting of West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers, Sept. 22, held at Huntington, W. Va. The committee consists of R. R. Webster (chairman), T. C. Harmon, T. W. Blake and M. A. Maxwell.

the drain tube, as this will not be an average sample of the bottom liquid.

When only a few samples of oil are to be tested each year it will be preferable to let some company that possesses the requisite facilities do the testing. Should the user be connected with the lines of a power company, this firm will usually test the oil free of charge. The Pittsburgh Transformer Co. makes dielectric tests of oil for its customers without charge. The General Electric Co. will make similar tests for dielectric strength, alkali and free sulphur for $1.50 per sample; for its customers, however, it will test three samples for dielectric strength free of charge, and over that number at $1 per sample. Any company that has a large quantity of oil and makes periodic tests should obtain a tester of its own, as it is much more convenient and soon pays for itself in the satisfaction of knowing that the oil used is safe at all times.

Precautions to Prevent Water Entering Sample

When oil is tested by a company making a business of such work the matter of preparing samples and shipping them must be given careful attention. Bottles for receiving samples must be thoroughly cleaned and dried. They should have a wide mouth and be sealed with cork rather than rubber, the cork first being coated with paraffin. The final closure is made with a sealing compound. This will avoid any possible chance of moisture getting in. After the oil has been placed in the bottle it should be immediately sealed and not allowed to stand even for a few minutes, as this might possibly make the test unreliable.

When the dielectric strength only is to be determined, 16 oz. will be sufficient, but if other tests are to be made not less than one quart should be sent. Each sample should be tagged, stating what part of the apparatus or drum it was taken from, the name of the apparatus and the serial number. The samples should be packed carefully to avoid any chance of breakage in shipment.

Companies desiring to make oil tests of their own might be interested in a few words concerning the apparatus used and its cost. The tester usually employed ascertains only dielectric strength and consists of a transformer, step-up switch and a cup that holds the oil and a standard spark gap. The cost of this outfit is about $125. The standard spark gap used for all oil testing consists of two terminals 1 in. in diameter and $\frac{1}{10}$ in. apart.

Raise Voltage Until It Breaks Down Oil Gap

This apparatus may be connected to an ordinary 110-volt alternating current. The voltage is raised by degrees until final breakdown occurs. In testing oil with this equipment the cup containing the gap should be carefully cleaned and dried and then filled with the sample of oil. It should then be allowed to stand for a few minutes to permit the air bubbles to escape. This is especially necessary if the oil is cold. The voltage can then be applied in steps as fast as the voltmeter can be read. Five breakdowns should be given to each filling and then the receptacle should be emptied and refilled from the original oil and again tested. This procedure should continue until at least three fillings are consistent within 10 per cent.

Oil in service, except in electrolyte lightning arresters, is graded as follows: If the oil fails between 25,000 and 30,000 volts it is considered excellent; if between 25,000 and 22,000 it is regarded as good; if between 22,000 and 16,000 it is said to be fair and below 16,000 it is considered bad and should be renewed or filtered immediately.

TESTS ON OIL SAMPLES FROM SEVERAL TRANSFORMERS

Record No. of Transformer	K.V.A.	Date Sample	Years Oil Has Been Used	Bottom or Top of Transformer	Volts at Breakdown	Remarks
E-373	65	5- 1-20	2.3	Bottom	7,000	As the result of this test the power company advised filtering. This work took a man 2 weeks, charge $104.50 including filtering. 3 bbl. spare oil at warehouse.
E-372	65	5- 1-20	2.3	Bottom	13,500	
E-371	65	5- 1-20	2.3	Bottom	35,000	
E-368	65	5- 1-20	1.4	Bottom	15,000	
E-369	65	5- 1-20	1.4	Bottom	16,000	
E-370	65	5- 1-20	2.3	Bottom	11,000	
E-256	65	1- 3-21	2.9	Top	0	.....
E-256	65	2-16-21	3.0	Top	21,000	.....
E-257	65	1- 3-21	2.9	Top	0	.....
E-257	65	2-16-21	3.0	Top	10,000	.....
E-258	65	1- 3-21	2.9	Top	40,000	.....
E-258	65	2-16-21	3.0	Top	33,600	.....
E-47	100	2- 8-21	3.2	Top	36,000	.....
E-48	100	10-20-20	3.0	Top	0	.....
E-48	100	2- 8-21	3.2	Top	35,600	10-29-19, 135 deg. F.
E-49	100	10-20-20	3.0	Top	23,000	.....
E-61	100	2- 8-21	3.2	Top	30,800	.....
E-62	100	10-20-20	3.0	Top	27,800	.....
E-63	100	10-20-20	3.0	Top	32,000	.....
E-43	100	2- 8-21	1.2	Top	40,400	.....
E-44	100	10-20-20	1.0	Top	32,800	.....
E-45	100	10-20-20	1.0	Top	9,000	.....
E-46	100	10-20-20	1.0	Top	0	.....
E-46	100	2- 8-21	1.2	Top	39,200	.....
E-624*	100	11-18-20	2.8	Top	8,500	Dark color
E 625*	100	11-18-20	2.8	Top	7,625	Dark color
E-626*	100	11-18-20	2.8	Top	9,000	Dark color
E-665	100	11-18-20	2.8	Top	19,500	.....
E-666	100	11-18-20	2.8	Top	22,000	7-25-18, 133 deg. F.
E-667	100	11-18-20	2.8	Top	15,000	.....
E-668	50	11-18-20	2.8	Top	18,000	.....
E-664	50	11-18-20	2.8	Top	14,250	.....
E-936	65	9-25-20	3.0	Bottom	14,250	79% of top 7-15-20, 114 deg. F.
E-936	65	9-25-20	3.0	Top	18,000	
E-937	65	9-25-20	3.0	Bottom	19,000	.....
E-938	65	9-25-20	3.0	Top	10,500	.....
E-933	65	9-25-20	4.0	Bottom	19,500	87% of top 7-15-20, 109 deg. F.
E-933	65	9-25-20	4.0	Bottom	22,500	
E-934	65	9-25-20	4.0	Top	18,500	.....
E-935	65	9-25-20	4.0	Bottom	16,500	.....
E-935	65	9-25-20	4.0	Top	20,000	.....

* New oil put in 9-8-1921, 360 gal. at 28 cents = $101. Frt. not included. Temperature tests were taken on dates shown because transformers were reported to be running "too hot."

If only a small quantity of oil is involved it would be preferable to renew it outright. For firms having large quantities of oil to keep in condition the filtering process is much more satisfactory and economical. Filtering can be done while the apparatus is in service, the process being continued until the oil proves by test to be entirely safe. When oil is simply renewed it is a difficult matter to remove all of the old inferior liquid. That which remains may lower the dielectric strength of the new oil.

The filtering process consists of forcing the liquid under pressure through several thicknesses of dried filter paper. This removes all moisture and foreign matter. The filtering machine is connected to the top and bottom of the container, and the oil is circulated through the filter press until tests prove it to be safe. Several machines are on the market using this principle. The cost of the smaller sizes ranges between $275 and $300.

The cost of filtering 870 gallons of oil with one of these machines by an outside company that already had its apparatus on the job was approximately 12c. per gallon. Another company filtering oil with its own machine filters 1,000 gallons during a period of three days, allowing one day to move the machine from place to place. This would make the cost of actual labor about 2c. per gallon. Where the machine has

to be shipped from one location to another the expense, of course, is much higher. It is a rather difficult matter to determine the exact cost of filtering on account of differences in the oil treated. Some oils would require much more time to filter and dehydrate than others.

In one instance, in 1921, 363 gallons of oil were renewed for 38.6c. per gallon, the cost including the freight and being reduced by the credit for empty steel drums. This shows that it is much cheaper to filter the oil than to renew it.

Another type of filtering and dehydrating machine utilizes the principle of centrifugal force and employs no filter paper. It appears to be highly satisfactory but actual data as to how thoroughly it dewaters the oil or what it costs per gallon to operate are lacking.

A copy of the record sheet of a test conducted on the oil from several transformers owned by a certain mining company is presented in the table herewith. It might be well to note on this sheet that in some tests the breakdown voltage was zero, but on a second trial proved good. This probably was due to moisture getting into the sample at some point. In other samples the dielectric strength of which proved to be low, the oil was dark in color and the low breakdown voltage probably was the result of sludge rather than of water. It will be well also to note the difference in the breakdown voltage of the top and bottom samples from the same transformer, showing in all cases that the bottom is the place where the poorest quality of oil is to be found.

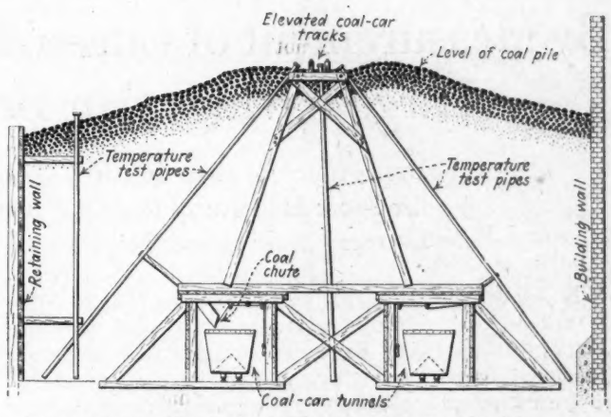
Storing Bituminous Coal in a 40-Ft. Pile

STORAGE of coal is one of the big problems of the day. The following hint by F. W. Randall, assistant to the general manager of the Rockingham County Light & Power Co., of Portsmouth, N. H., published in the *Electrical World*, is intended for central-station storage but may appeal to any kind of consumer. If operators could recommend to consumers a method of storage that would be reasonably safe and economical it would be possible to approach strikes of mines and railroads with coal on hand convenient to the point where it has to be used. Some features of this plan with trifling modifications should be available also for use in storage of coal around the mines.

It will be noted that pipes are put in place before the coal is deposited. These pipes are used as runways for thermometers lowered and raised by strong cords marked at regular intervals by knots which enable the depth at which readings are made to be noted. Then, by reference to an appropriate drawing the behavior of the coal in any section of the pile can be studied.

When a new cargo of coal is placed in the pocket, tests of the temperature are made daily in each pipe until the exact conditions in all parts of the pile are determined. The pipes are 2 in. in diameter and are placed at frequent intervals and permanently clamped into position. The tunnels from which the coal is drawn for station use are numbered, and chutes 5 ft. apart are installed. If any spot shows signs of overheating, coal is drawn from the nearest chute until the hot spot is removed. The thermometers are inclosed in wooden frames to prevent breakage.

The arrangement was inexpensive to install and has permitted the storage of large stocks of coal to a maximum depth of 40 ft. with a substantial degree of security from fire. The pocket installation was designed by W. H. Allen, of the company's engineering department, and has given excellent service.



COAL PILE WITH CHUTEWAYS FOR COAL CARS AND WITH PIPES FOR TESTING HEAT OF PILE

Temperatures are taken by lowering thermometers inclosed in a wooden frame down the pipes, knotted lines showing the point at which the temperatures are taken. Any coal that heats prematurely is withdrawn by the chutes.

Chain Curtain Saves Coal on Long Chutes

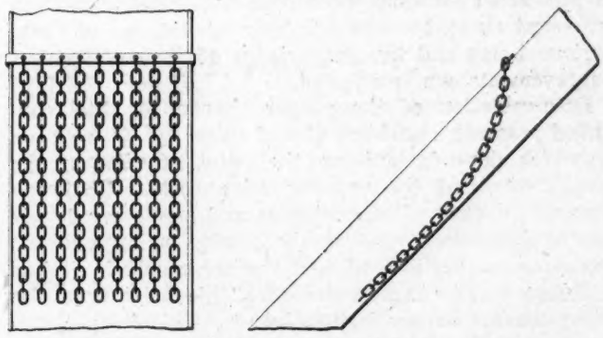
BY JOHN S. WATTS
New Glasgow, N. S.

COAL or other material traveling down a long chute will attain a destructive velocity, and as it is not always possible to avoid using such a long incline and the excessive velocity thus engendered the retarding curtain shown in the accompanying sketch was devised.*

The curtain is made of several lengths of chain salvaged from the scrap pile and connected to a bar which is bolted to the chute sides as shown in the sketch. When the material to be handled is in large lumps a heavy chain spaced 6 to 9 in. apart gives the best results. For smaller pieces a large number of small chains is most effective. The best size and length of chains can be quickly determined by trial.

When the chute is delivering onto a picking table it is most desirable to have the stream of coal delivered in a thin, steady sheet, and to effect this the chain should be fairly long.

This curtain has proved an effective retarder and at trifling cost will keep the speed of the coal within reasonable limits on the steepest and longest chutes. For long chutes two or more curtains may be needed.



CHAIN HUNG OVER CHUTES LETS COAL DOWN EASILY

Should the chute be long more curtains of chains may be used with advantage. They will keep the speed of the coal within reason.

*Chain curtains are being used in the anthracite region for this same purpose. The device which Mr. Watts has thought out for his own needs is doubtless one which has been in use for many years. It is reprinted here because it might be of value to some who have never seen it in operation.—EDITOR.

By Measurement of Current Used and Extended Records Large Savings Can Be Made in Power Cost*

Importance of Cost Records Grows as Power Use Increases — Need for More Recording Devices—Contracts Should Be Based on Peaks Longer Than Five Minutes — Keep Power Factor Near Unity

IN A business as highly competitive as that of bituminous-coal mining it is essential that accurate production costs be kept covering, by separate classification of items, every step in the operations performed from coal face to railway car. In the earlier years of the industry the investment was so moderate and the operating expense so low that the item of power cost was almost negligible as a factor in production. As a result recording, measuring or weighing apparatus was omitted from the original equipment and consequently it was impossible to calculate how much was expended in power. Rough approximations were used in the cost sheets of the mine.

Of late years the general introduction of purchased power, with the necessity of comparing costs between energy purchased and that generated, has brought about entirely different conditions. Another reason for proper cost keeping is the fact that the expense of both classes of power has risen so much that the original paltry item of power expense now represents a substantial percentage of total costs. Records show a variation of from 2 or 3c. up to as much as 25c. per ton over a fairly large output. It is now therefore necessary to give this item close attention.

The checking of power costs falls naturally into two divisions: (1) Where a power plant is installed and operated by the mining company and (2) where power is purchased from a central station.

Totalizing Watt-Hour Meters Needed

In the first case, in order to proceed intelligently, totalizing plant watt-hour meters must be installed. Accurate account should be kept of all items of expense such as oil, waste, repairs, upkeep and the like, and provision must be made for either weighing or closely estimating the fuel consumption. The man responsible for power-house operation should be furnished with monthly detailed cost sheets for his department, just as the superintendent of mines is furnished with a mine cost sheet, because it is only by scrutiny of these various items and by comparisons of the results that improvements can be effected.

Determination of the proper charge for fuel consumed presents a problem of real difficulty, the solution of which depends both on the point of view of the accountants and the varying mine costs. Obviously under conditions of high market and ample car supply fuel should be charged at the market price, whereas when the market is weak and the car supply is limited a different value is represented. This holds true also when the car supply is insufficient. This item, therefore, must be left to individual judgment, and on account of its variable nature it is the source of much dispute between mine owner and central-station power salesman.

Assuming that proper measuring devices are installed and accurate cost accounts are kept, power production may be tabulated under the following headings:

Total Kw.-Hr. Generated	Total Cost	Cost per Kw.-Hr.	Kw.-Hr. per Ton Mined	Tons Mined Total	Tons Burned Total	Power Cost per Ton Mined

Other tabulations may of course be used if the completeness of the records make such cost keeping possible. A column headed "Pounds of coal per kilowatt-hour" indicates the generating efficiency from boiler furnace to switchboard. Naturally a wide variation will be obtained in these entries on account of the market, car supply, and similar items that influence the mine output, but after such records have been compiled for months or years, comparisons are obtainable which will cover a wide range in operating conditions. Monthly or even daily study of these records will enable the power superintendent to discover either a falling off or improvement in results and to locate the cause.

In the case of purchased current, which has been largely adopted where available, power superintendents find themselves called upon merely to check the accuracy of the monthly power bills. Some territories are served by several power companies, all with different rate schedules. All, however, first impose a "demand charge" or "capacity charge" at a fixed rate per kilowatt of the "highest integrated demand" over a stated time interval. This period may be one, three, five, ten or fifteen minutes. In fact it may be any period, but the list given covers those that are commonly used. The energy charge is made up by computing the cost of the kilowatt-hours through application of a sliding rate scale.

Demand or Readiness-to-Serve Charge

A word as to the origin and meaning of the "demand charge" may be in order. Many years ago, when the power companies, on account of the great growth of this part of their business, began to pay scientific attention to their rate schedules, it was observed that one consumer might require heavy installation investment on the part of the power company amounting to many horsepower, but through intermittent use might yield only a small monthly return in the shape of a power bill. Another consumer with an installation requiring a similar investment but calling for steady service might afford a highly satisfactory return.

Little-used storage warehouses, for example, equipped with freight elevators might require 25 kw. in line and transformer service though they would return to the power company such insignificant sums monthly as would be in many cases insufficient to pay even the interest on the installation equipment.

Accordingly a charge was established known in the earlier days as a "readiness-to-serve" charge. It was

*Report of Committee on Methods of Checking Power Costs at meeting of West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers to be held on Sept. 19, 1922, at Huntington, W. Va. M. A. Maxwell (chairman), C. E. Rogers, Reuben Lee and L. C. McAllister, members of the committee.

held that inasmuch as a consumer of large demand but small consumption expected to take from the lines his maximum requirements at any hour of the day, the power company must hold this amount of energy subject to his call—that is, would be prohibited from contracting for it to another. The public service company therefore expected him to pay at least $1 per connected horsepower per month as a "readiness-to-serve" charge.

For some years this was considered in the light of a minimum payment, but later a distinct separation of charges was made based on the following process of reasoning. At that time the cost of one horsepower installed in a steam generating station was considered to be about $100. Figuring 6 per cent interest and 6 per cent annual depreciation, a yearly "demand charge" of $12 per horsepower was indicated. Soon the power companies were basing their rates on, first, a "demand" or "capacity" charge of $1 per horsepower per month, and, second, an "energy" charge of so much per kilowatt-hour consumed. This was done in order to guarantee a return from each horsepower of installed station capacity sufficient to carry interest and depreciation, regardless of the energy the consumer actually used.

One Dollar per Month Found Insufficient

With the development of large steam turbo-generators, which, because of their large capacity, cannot reach out over a sufficiently large territory to absorb their enormous output without both extensive and expensive transmission systems, this charge of $1 per horsepower per month was found insufficient to meet the charges on the heavy unit investments. A change accordingly was made to the "kilowatt-per-month" basis with a substantial increase in the rate.

It must be borne in mind that this charge is in no sense intended to cover the energy delivered but is made solely in order that the consumer may bear the "stand-by" charges of interest and depreciation on the capacity reserved for his use. It takes effect regardless of whether he consumes any energy or not. Obviously, this being the case, this "demand charge" should yield no profit whatever to the power company, which must look to the sale of energy for dividends. The suspicion on the part of consumers that the power companies are really making profits out of these demand charges through overlapping has been the cause of much litigation before the public service commissions and has resulted in most cases in the commissions prescribing the charges for this part of the total billing.

Demand Charges in Huntington District

In the territory adjacent to Huntington, W. Va., three large power systems have been installed. One of these charges $1.80 per kilowatt of highest integrated 5-minute demand per month, another $1.92 per kilowatt of highest integrated 3-minute demand, and the third charges $1.65 per kilowatt on a 15-minute demand, the two last named using an alternative method known as "agreed standard capacity" or demand calculated from connected load. All have energy rate schedules with little in common.

Through the courtesy of J. H. Edwards, who has compared the demand made by the same load over several months, based on these different time periods, the following table is presented. This gives an idea of the effect of these different peak-period specifications on the total demand charges.

CONSUMPTION PEAKS OF DIFFERENT DURATIONS AS OBSERVED IN OPERATION OF TWO PLANTS

	Kilowatts Consumed 1-min. Peak	Kilowatts Consumed 5-min. Peak	Kilowatts Consumed 15 min. Peak
Plant No. 1:			
March	490	440	400
April	560	510	440
May	520	480	440
Plant No. 2:			
One month only	318	285	230

Consideration of this table shows the importance to the mine owner of having a peak period of at least 5 minutes and longer if obtainable.

Other companies in the northern part of West Virginia include in their contracts a clause providing penalties for bad power factor. Inductive load, such as that resulting from the application of induction motors to fans, pumps tipples, etc., causes the current to lag behind the impressed voltage, with which it is therefore out of step to a certain extent. The cosine of the angle of such lag is expressed as a decimal, or percentage, and is used to indicate the power factor or P.F. That portion of the current flowing through the receiving apparatus which is out of step with or is lagging behind the impressed voltage represents no energy, and is therefore known as "wattless current," while that in step is called "energy current."

Without discussing the technical features of this phenomenon it may be stated that the use of induction motors tends to increase this lag and results in low power factor, while synchronous motors possess the inherent capacity of not only correcting the inductive effect of their own windings but of compensating for a certain quantity of other inductive load. This is accomplished by overexciting the field circuit of the synchronous machines, and if the proportion of these units to the total load is large enough, the current may even be made to precede or lead the impressed voltage. Under these circumstances a leading power factor is secured which is fully as undesirable as a lagging power factor.

Combine Synchronous and Inductive Load

As unity power factor is most advantageous a judicious combination of synchronous and inductive load is desirable. The rotary converter may be designed with sufficient field capacity to bring about unity power factor and even to compensate for a limited amount of induction-motor load. The synchronous motor, however, has a wider latitude in this respect and may compensate for an appreciable quantity of inductive load.

Central-station companies object to low power factor because the presence of any considerable quantity of lagging or wattless current in their circuits results in poor transformer and line regulation, making necessary an inordinately high generating voltage if a given receiver voltage is to be attained. This also necessitates greater carrying capacity in the generator windings. The line losses arising from this cause may be appreciable.

The consumer, with his short distribution lines, and generally ample motor capacity, is not greatly concerned over low power factor so long as it does not affect his pocketbook. In view of the tendency of the power companies toward penalty clauses and with due regard to the betterment of over-all efficiency, modern design should provide for reasonably good power factor on all receiving circuits. It is unfortunate that the

limitations of the synchronous motor prohibit its more general adoption. A range varying from 52 to 100 per cent in power factor of mine loads has been observed.

In keeping records of mine power bills the following tabulation has been found convenient:

Month	Kilowatt-Hours Used	Kilowatt Demand	Demand Rate	Demand Charge	Energy Charge	Total Charge
June	49,920	264	1.92	$506.88	$701.65	$1,208.53

Discount	Net Bill	Cost per Kilowatt Hour	Kilowatt-Hours per Ton Mined	Cost per Ton	Tons Mined
$26.40	$1,182.13	2.37	3.36	7.99	14,814

The figures above tabulated have been taken from records of a mine located in the Winding Gulf field. By keeping a sheet for each operation and placing the results for the whole twelve months of the year on each sheet, any bill that is "out of line" may be spotted at a glance. By keeping these sheets in a loose-leaf binder, records covering years of operation are made easily available. As new entries are made comparisons with similar outputs in previous months show whether the bill is normal or needs investigation.

Such companies use meters rather freely about the works, differentiating the power consumed into "Used for machine cutting, tipples, fans, town lighting, haulage" and the like. This is of value, however, only where the company is sufficiently large and prosperous to maintain a superintendent of power distribution, as the average mine electrician usually is too busy with pressing repair work to inspect and analyze such records.

Daily and Monthly Load-Factor Calculations

Careful consideration of the method above outlined of making a total charge based on a combination of the highest peak multiplied by a fixed rate plus a scale rate for the energy (kilowatt-hours) consumed shows that the lowest net rate per kilowatt-hour on the total billing will accrue if the peak is kept down to as small a fraction of the total power used as possible. The daily load factor of a given receiving installation is the ratio of the number of kilowatt-hours actually used to the maximum number of kilowatt-hours that would have been used had the maximum demand been maintained throughout the entire 24 hours. Thus expressed mathematically the daily load factor becomes

$$\frac{\textit{Kilowatt-Hours Used}}{\textit{Maximum Demand} \times 24}$$

and the monthly load factor then is:

$$\frac{\textit{Kilowatt-Hours Used}}{\textit{Maximum Demand} \times 24 \times \textit{days in month}}$$

As showing actual load factors at various plants the following may be of interest. These are taken on a monthly basis assuming an average of 730 hours per month:

Plant No. 1 $\frac{170{,}200 \text{ kw.-hr.}}{600 \text{ kw.} \times 730 \text{ hr.}} = 38.9$ per cent

Plant No. 2 $\frac{2{,}260 \text{ kw.-hr.}}{50 \text{ kw.} \times 730 \text{ hr.}} = 6.2$ per cent

Plant No. 3 $\frac{88{,}000 \text{ kw.-hr.}}{400 \text{ kw.} \times 730 \text{ hr.}} = 30.1$ per cent

Plant No. 4 $\frac{109{,}300 \text{ kw.-hr.}}{518.4 \text{ kw.} \times 730 \text{ hr}} = 28.9$ per cent

To illustrate how basing the maximum demand on different time intervals over which the load is integrated affects the load factor the following figures taken from actual operating records are given:

LOAD FACTORS USING DIFFERENT TIME INTERVALS FOR PEAKS

Plant No. 1

(a) One-minute peak $\frac{142{,}730}{475 \times 730} = 41$ per cent

(b) Five-minute peak $\frac{142{,}730}{433 \times 730} = 45$ per cent

(c) Fifteen-minute peak $\frac{142{,}730}{384 \times 730} = 52.4$ per cent

Another term frequently heard among power solicitors is "diversity factor." This is the ratio of the actual peak obtainable by combination of several separate loads to the sum total of the individual peaks. For example, assume a certain coal acreage, with a number of developments, each supplied by its own power plant. The instantaneous peaks at plants Nos. 1, 2, 3 and 4 may be 200, 250, 300 and 150 kw. respectively. The sum of these peaks is 900 kw.

Now if lines are run to a central point, and the total power requirements are either generated at one central plant or purchased from a power company, the peak will not amount to 900 kw. because of the improbability of all four plants taking their maximum peaks at the same instant. On the contrary, the actual peak obtained may amount to only 700 kw., in which case the diversity factor is $\frac{700}{900}$ or 77.7 per cent.

Why Five-Minute Interval Seems Fair

In mine work, however, because average hauls up tramway grades last but one or two minutes, if 5 minutes or more is the time period over which the load is integrated, it will be found that the combined peaks approach the total of the individual peaks quite closely, so that consideration of the diversity factor assumes less importance except where few units are thus combined.

In reference to town lighting, inspection of available records made by companies that have installed house meters warrants the conclusion that a charge of 1c. per watt per lamp per month will amply protect the power company from loss on this business. All large power users should install curve-drawing meters. Aside from their absolute check on the power company's demand meters, these instruments afford opportunity for study of the load.

Of all the suggestions here made none is more valuable than that advocating monthly tabulation sheets of power costs. It would be a busy electrician indeed who could not find the time necessary to jot down these data and compare results with previous entries. When this is done any power bill that is "out of line" will be spotted instantly.

A Lignite Fuel has been produced by the Bureau of Mines in the course of its North Dakota experiments at a cost comparable with that of the domestic sizes of anthracite in Pennsylvania. No small portion of the credit for this successful outcome of these experiments is given by the Bureau of Mines to Dean E. E. Babcock, of the University of North Dakota. The beneficiation of the lignite was accomplished in a new type of shaft furnace which was built after careful preliminary study. The results show a greater efficiency than had been expected. Two carloads of lignite were recently carbonized at the rate of ten tons per day. A satisfactory residue was obtained at an approximate cost of $5.50 per ton, as against a cost of approximate'y $6 25 a ton for the residue produced in the oven used in the experiments conducted during the summer of 1921. The costs are low enough to demonstrate conclusively the practicability of establishing commercial plants. It is understood that North Dakota officials have plans under way which insure manufacture on a commercial scale.

Problems of Operating Men

Edited by James T. Beard

Humidifying Air Currents by Means of Steam

Sprinkling by Water Cars and Pipe Spraying Systems Not Reliable—Humidifying by Means of Steam Gives Better Results—Plan Adopted in a Western Mine

WHAT appears to be an effective method of laying dust in coal mines is described, in an interesting manner, by F. C. Cornet, *Coal Age*, Aug. 3, p. 169. The article draws particular attention to the need often presented of treating each air split separately, because of the practical impossibility of suitably humidifying large air volumes with steam.

In reference to other methods of dampening the dust to prevent its suspension in the air current, it is commonly known by those acquainted with the dust problem, in coal mining, that too much reliance cannot be placed on the use of water cars and pipe spraying systems for that purpose. These methods only reach such places as are easily accessible and a wider distribution of the water is required in order to be effective.

In his "Mining Engineer's Handbook," page 1439, Robert Peele gives four ways of wetting dust in coal mines, namely: "1. Liberal hosing. 2. Thorough wetting by force-pump sprinkling cars. 3. High-pressure, fixed sprinklers, at close intervals, on continuous pipe lines, so that when turned on all surfaces will be wetted. 4. Humidifying the intake air current with exhaust steam from the fan or other engine, both to prevent drying out the mine and, by supersaturating, to carry in moisture that will be deposited on the dust on ribs and roof."

Plan of Humidification Adopted by Colorado Fuel & Iron Co.

As previously stated, the first three methods here given are ineffectual. The method last named has been successfully employed by the Colorado Fuel & Iron Co., at several of their operations in the West. The plan adopted there has been described by B. J. Matteson, of that company, and is the following:

Steam radiators are placed on both sides of the intake heading where the entire volume of air is passing into the mine. Live steam is supplied to these radiators, by which means the temperature of the entering air is raised and its capacity to absorb moisture correspondingly increased.

The waste steam from the radiators, passing through a one-inch gate valve, is conducted by a perforated pipe to a point a short distance inby on the airway, where is arranged a curtain of burlap or brattice cloth, the purpose of which is to bring the moisture or condensed steam more intimately in contact with the passing air.

By these means, the saturation of the air current is rendered well nigh complete at its increased temperature, which is practically 70 deg. F. It is clear that in its passage through the mines, the temperature of the air will be lowered and much of its moisture will be deposited in the workings.

Suffice it to say that this arrangement has proved eminently successful in every mine where it has been installed. The result has been that all parts of the workings have been kept in a moist condition. In Colorado, the relative humidity of the atmosphere, in the winter time, does not average above 15 per cent. At such times much water must be furnished to the air current, or it will dry out the mine in a short time.

CHARLES M. SCHLOSS.

Denver, Colo.

ANOTHER LETTER

Information asked regarding data that will assist study of the problem—The Mt. Mulligan explosion—What it demonstrated—The Monongah explosion.

AS an old student of watering problems and designs intended to increase the safety of mines through the application of water, I have been much interested in reading the article by F. C. Cornet regarding the humidifying of mine workings by steam, *Coal Age*, Aug. 3, p. 169.

For the purpose of studying the matter more closely, I would like to ask, through *Coal Age*, if Mr. Cornet will not kindly furnish interested readers with the following data, calculated to throw much light on the actual results obtained in the application of the method of humidifying a mine in the manner described. The points on which information is asked are the following:

Information Desired

1. Are all the main haulage roads in the mine return airways? 2. Is any reversal of the air current contemplated in the mine? 3. What is the temperature of the exhaust steam, at the point where it issues from the pipe? 4. What is the water gage in the airway, at this point? 5. What are the readings of the wet- and dry-bulb thermometers, at the same point; also, at various distances from the fan, say at the first working face; again, at the farthest point inby in the mine; and then at the last working place, say 100 ft. or so from the shaft or slope bottom or the discharge portal of the mine; also, similar readings taken outside of the mine at the same time? 6. Is the mine naturally wet or dry?

The Mt. Mulligan Mine Explosion Queensland

Mr. Cornet may have noticed the report of a disastrous explosion that occurred at the Mt. Mulligan colliery, in Queensland. The report of the explosion gave the outside temperature as between 80 and 90 deg. F., and the temperature in the mine about 85 deg., compelling the miners to work in light attire and minus their shirts.

The Mt. Mulligan mine was a dry one. The roof and floor of the seam were of a fireclay nature that disintegrated on the application of water. The packwalls in the mine being built of this material, it was necessary to keep the ventilating current as dry as possible; and, owing to the high temperature of the mine, the mine air must be as dry as possible, in order to enable the men to work with more comfort.

Under these conditions, humidity readings, in the mine, varied from 84 to 88 for the dry-bulb and from 73 to 79 deg. for the wet-bulb thermometer. These readings showed that the air contained from 6.7 to 9.0 grains of water, per cubic foot of air. While it would have been possible to have saturated the 88-deg. temperature with 14 grains of water, per cubic foot, the miners would not then have been able to work in such an atmosphere.

What the Explosion Proved

The Mt. Mulligan explosion demonstrated that, in a mine totally devoid of firedamp and where the road dust consisted of about 33 per cent of noninflammable dust, and the moisture content was probably in excess of that in Mr. Cornet's proposition, the conditions did not prevent the flame of the explosion from spreading throughout the mine and killing every person therein to the number of 75 men.

There was, however, evidence of some retarding influence present, as the explosion did not extend throughout the mine at what we might call the usual speed. For example, the force of the explosion was not demonstrated at the

same time at both mine openings. There was a difference of about one or two seconds between the issuing of the blast from the fan tunnel and that from the haulage tunnel.

The Monongah Mine Explosion West Virginia

Mr. Cornet made reference, incidentally, to the Monongah mine explosion, which occurred several years ago (Dec. 6, 1907, 361 lives) though it is not clear what this reference proves.

I have always regarded that explosion as due to shotfiring in the easterly mine, this being largely proved by the time of the manifestation of the force of the explosion on the surface. It was generally concluded, however, that the explosion was the result of a runaway trip of cars in the westerly mine and the smashing of an electric lamp, which ignited the coal dust cloud that followed the wreck.

From all published accounts of the Monongah explosion, I have always been impressed with the idea that it could not have originated in the westerly mine as was the conclusion of those who investigated the disaster. However, I fail to see how this affair bears on the question of humidification of mine air.

Allow me to state, in closing, that damping the ventilating current of a mine can only exert one effect. It may, to some extent, cause the coal dust to fall to the ground or settle on the sides and timbers in roads and travelingways. It is my belief that such accumulations of dust will be more dangerous than if water, in any form, had never been applied. There may be something more to be said when the information asked is available.

James Ashworth,
Consulting Mining Engineer.
Livingstone, Alta., Canada.

Shooting Machine Mined Coal

Dependent shots unsafe—Law restricting blasts in Colorado mines—Firing a round of shots in machine mining—Snubbing holes in thick coal.

REFERRING to the interesting letter of Oscar H. Jones, *Coal Age*, June 15, p. 1008, permit me to say that, in writing on the subject of "Following or Dependent Shots," he has drawn attention to one of the most dangerous practices in the mining of coal. I agree with him that all such shots are shots on the solid.

That dependent shots are unsafe is emphatically true, and no argument is needed to convince a practical miner of this point. In my opinion, our mining laws should be more explicit in defining allowable practices in the shooting of coal and severe penalties should be imposed on violators of the acts.

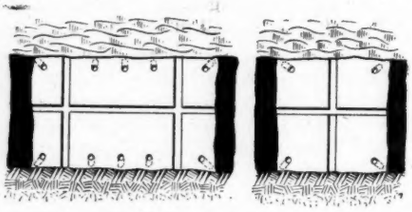
Among other things mentioned in the Colorado Coal Mining Law, in relation to blasting, dependent shots and shots that are overcharged are prohibited (Sec. 153). Even with these restrictions, the question is often disputed as to a shot being dependent as prepared by a miner.

It is a common thing for a miner to quarrel with the shotlighter on this point. Where the coal has been mined by machine the miner will often have arranged a round of shots that he wants fired at one time, claiming that they are not dependent one on the other. Controversy of this kind will continue as long as the law is not more specific.

With the ordinary type of coal-cutting machine that undermines the coal at the floor, particularly in the working of a hard coal, a complete round of shots, at or near the roof, necessarily presents a condition of dependent shots when fired by fuse.

In this connection, allow me to offer a sketch showing the plan I would suggest as to how the coal should be cut and the shots located and which I believe will prove safe practice. On the left of the figure is shown the face of the coal in a wide, double-track room, in a seam of coal varying from 8 to 10 ft. in thickness.

On the right of the figure, is shown a similar cutting of the coal and locating



MINING AND SHOOTING THE COAL

of shots when driving a narrow heading, in a thick seam. In each case the shots at the floor are fired first to mine the lower bench of coal, the shots at the roof being fired later. Likewise the rib shots, in the wide opening at the left, follow the firing of the center shots.

Danger in Firing Several Shots in Quick Succession

The shooting of several holes at one time, in a working place, is always dangerous when the holes are fired by fuse or squib. In the use of that method one shot follows another in quick succession and, often, not in the order desired. In any case, succeeding shots discharge their flame into a disturbed atmosphere laden with dust and inflammable gases.

It is not anything strange that this often results in a local explosion of the gas and dust produced by the first shots, or at least a very windy shot. The miner is particularly fortunate if the disturbance is not propagated throughout the mine, which will depend alone on the conditions.

In order to avoid this danger, not only is it advisable to eliminate the use of black powder and examine the place for gas before shooting; but all shots should be fired with an electric battery, which will insure their simultaneous explosion, as a single shot.

Incidentally, firing shots by battery will no doubt tend to slow down the high-speed habit of many shotlighters, some of whom make a marathon runner look like an ice wagon, in their hurry to seek a place of safety after lighting a round of shots.

In a few words, let me say that the firing of shots in rapid succession, whether they are dependent or otherwise, has undoubtedly been the cause of a number of explosions in our mines. More time given to the firing of shots may slightly increase the cost of production; but this will fall far short of the cost of putting a mine again in shape following an explosion.

Allow me to remark, in closing, that where solid shooting is permitted in a mine the issue can only be met by the employment of highly skilled, conscientious and practical miners as shotlighters, and clothing them with authority to condemn and refuse to fire any shots that, in their opinion, are unsafe.

Thomas Allen.
Mt. Harris, Colo.

Why Change the Colorado Law?

Colorado law requires the certification of mine foremen and other mine officials—The law makes any interference with the mine foreman a misdemeanor punishable by fine or imprisonment or both.

KINDLY permit me to offer a few comments, in reply to the letter of "Colorado Miner," *Coal Age*, July 6, p. 19, who thinks that the Colorado law should be changed so as to require all men in charge of operations underground to be certified.

In that letter, the writer repeats the argument so often made that the mine foreman is frequently overruled by the superintendent, who is his superior in office. He claims that for a mine foreman to dispute the authority of a superintendent will cost him his job. While that may be true in some few instances, I cannot think that it applies, in general, to foremen in Colorado where the law is very specific in this regard and makes the mine foreman supreme in the mine.

The letter strongly implies that the writer believes the mine superintendent, also, should be required to hold a certificate, the same as the mine foreman. In that case, we would have to include any mine owner, lessee, manager, operator or agent, all of which are placed in the same category, by Section 1 of the Colorado law.

Purpose of Certification

Now, without prolonging the argument, I want to ask: What is the purpose of the certification of mine officials and who is responsible for this requirement of the law? Evidently, the purpose is to secure the safety of all mine workers; and public opinion is responsible for this feature being incorporated in our laws.

As I read the Colorado statute, any person in charge of underground operations is obliged to hold a certificate, showing his competency to fill that position, as determined by examination and in the best judgment of the state board of examiners.

Allow me to quote briefly from two sections of the Colorado law. bearing on

the authority of the mine foreman in matters pertaining to the mine as regards its safe operation. Section 44 of the law reads, in part, as follows:

"The mine foreman shall have full charge of all inside workings and of all persons employed therein, in order that all the provisions of this act, so far as they relate to his duties, shall be complied with and the regulations described for each class of workman under his charge carried out in the strictest manner possible. Any superintendent or other person who interferes with the mine foreman in the discharge of his duties as described by this act shall be deemed guilty of a misdemeanor."

Again, in reference to penalties prescribed by the law, Section 172 reads as follows:

COLORADO PROVIDES PENALTIES FOR VIOLATIONS OF THE ACT

"Any violation of any provision of this act shall be deemed a misdemeanor and shall be punished by a fine of not more than one thousand dollars or by imprisonment of not more than one year in the county jail, or by both such fine and imprisonment."

How any law could be more specific in prescribing the authority of mine officials in charge of underground operations is hard to understand. Neither is it clear, to my mind how the certification of the mine superintendent would improve the situation in any respect whatsoever.

Take, for example, any of the large coal companies in this state, say the Colorado Fuel & Iron Co. Let us assume they have twenty-five mines in charge of twenty-five mine foremen. In addition, let us say, there will be fifty assistant foremen, fifty firebosses, and fifty shotfirers.

Here are 175 certified men in charge of underground operations in these twenty-five mines. Allow me to ask, if the certification of the twenty-five superintendents of these mines would make the operation of those mines any safer? In discussing these questions, let us use some common sense and view the matter from a practical standpoint.

In closing, I want to say that if a mine foreman is over-ruled by his superintendent, in matters pertaining to the safe operation of the mine, there is something wrong. If, in the judgment of the superintendent, the foreman is incompetent a more capable man should be secured at once and the sooner the better. ROBERT A. MARSHALL.

Walsenburg, Colo.

Peace and Harmony

Timely suggestions applying to the present situation in coal mining—The get-together spirit—Meetings of mine officials and men promote goodwill and harmony.

JUST now, nothing is of more interest and importance than suggestions looking to the promotion of peace and harmony, in the general rank and file of the coal-mining industry. Ever since reading the suggestion made by more than one writer, sometime since in *Coal Age*, I have been deeply impressed with the thought then expressed that great good would result if employers and employees would meet together at regular short intervals.

WEEKLY MEETINGS A BENEFIT

In my opinion, such weekly or biweekly meetings, at some convenient place, would be the means of avoiding much of the trouble that now arises between miners and mine officials. Questions relating to the health and safety of mine workers, the most improved methods of mining the coal, timbering of airways, ventilating the working places, and other matters of interest could be profitably discussed at these gatherings.

To my mind, it would be an excellent plan to hold one of these meetings the night before the regular meeting night of the miners' local organization. By so doing, it would give an opportunity to anticipate and discuss any grievances that might be arranged to come before the miners' meeting the following night.

My idea is that all mine officials, from the superintendent down, should be present at the meeting and, by showing a real concern for all that pertains to the welfare of the employees, establish an ever-growing confidence of the men in the good faith of their employers.

With much pleasure, I read the excellent letter of G. W. Breeden, *Coal Age*, Aug. 24, p. 290, entitled "Gaining the Confidence of Men," and I want to endorse what he has said in regard to the effect of kind treatment and a reasonable familiarity of mine officials with their men.

It is not too much to say that many suggestions would often be forthcoming from the men that would enable a reduction in the cost of producing coal and these would relate to every branch of mining, hauling, pumping, drainage, tracklaying and other work with which the men are most familiar.

There are mines where such meetings have been conducted with great success and profit to all concerned. At times, reading rooms and classes of instruction have been organized and it would be a pleasure to know that such a system is, or shortly will be established in every locality. Not the least result is a general reduction of accidents in all classes of work in the mine.

Nanty Glo, Pa. M. J. FACEMEYER.

Inquiries Of General Interest

Estimating Equipment for Engine-Plane Haulage

Allowance Made for Unavoidable Delays and Changing Trips—Number of Hoists per Day—Speed of Hoisting—Size of Rope and Drum—Horsepower of Engine and Boiler

AS a subscriber of *Coal Age*, I take the liberty of asking its assistance in working out the solution of a proposition with which we are concerned. It relates to the necessary equipment for an engine-plane haulage that will give satisfactory results in its operation.

We desire to hoist prepared coal up a plane 400 ft. in length and having an inclination of 30 deg. It is required to hoist 200 tons of coal, per day of 8-hrs., in cars having a capacity of 2 tons each. Allowance should be made for changing trips, say one minute at the top and one minute at the bottom of the plane. The proper solution of this problem will be greatly appreciated.

Joliet, Pa. EDGAR I. ARTZ.

The first step, in the solution of this problem, is to estimate the time occupied in actual hoisting of the loaded trips up the plane. In an 8-hr. day, there are $8 \times 60 = 480$ min., from which we will deduct, say 40 min. for unavoidable delays during the day. Hauling 200 tons, in 2-ton cars, will require 100 hoists per day. Then, allowing one minute lost in changing ropes at the top of the plane and the same at the bottom of the incline, makes a total of 200 minutes lost between trips. The time remaining and consumed in actual hoisting the loads and lowering the empty cars is, therefore, $480 - (40 + 200) = 240$ min.

Now, hoisting at a rate of, say 5-ft. per sec. gives $400 \div 5 = 80$ sec. for hoisting a single loaded car. For convenience in calculation, we will assume the time for hoisting a loaded car is 84 sec. and the time for lowering an empty car 60 sec., making a total of $84 + 60 = 144$ sec., for a single round trip. The total time consumed in making 100 round trips is, therefore $(100 \times 144) \div 60 = 240$ min., which agrees with our previous allowance.

The next step is to estimate the load on the rope when hoisting a loaded 2-ton car, adding 40 per cent of the load for the weight of the car, which makes the actual load hoisted $2 \times 1.40 = 2.8$ tons, exclusive of the weight of the rope itself, lying on the plane when the car is at the foot of the incline.

Hauling on a steep 30-deg. pitch, the load on the rope is the sum of the gravity pull and the friction pull. The weight of the loaded car is $2.8 \times 2{,}000 = 5{,}600$ lb. The gravity pull is $5{,}600 \times \sin 30° = 5{,}600 \times 0.5 = 2{,}800$ lb.

Again, taking the track resistance as 20 lb. per ton of normal pressure on the plane, the friction pull is 1/100 of the weight hoisted multiplied by the cosine (0.866) of the angle of inclination; or 0.01 × 5,600 × 0.866 = say 50 lb., which makes the total pull on the rope 2,850 lb., or 1.425 tons.

Since the breaking strain of a 1-in., 7-wire, 6-strand, cast-steel, haulage rope is 32 tons, and using a factor of safety of five, the diameter of rope required, in this case, is $d = \sqrt{5 \times 1.425/32} = 0.47$, say ½ in. But, making due allowance for wear and tear, it will be advisable to use a ¾-in. rope weighing 400 × 0.89 = 356 lb., which will add about 200 lb., including friction, to the load on the engine. This gives a total load of 3,050 lb. to be hoisted at a speed of, say 5 × 60 = 300 ft. per min.

In mine-haulage practice it is customary, in order to avoid an undue bending strain in the rope winding on the drum, to make the diameter of the drum not less than sixty times the diameter of the rope. In this case, therefore, the minimum allowable diameter of drum when using a ¾-in., 7-wire, haulage rope, is 60 × ¾ = 45 in. We would therefore suggest using a 4-ft. drum.

Finally, assuming an efficiency of the hoisting engine as 80 per cent, the indicated horsepower required for this hoist is

$$H = \frac{3{,}050 \times 300}{0.80 \times 33{,}000} = \text{say } 35 \text{ } hp.$$

It would be interesting, if space permitted, to go on and estimate the size and kind of boiler required. Suffice it to say that, in boiler practice, it is customary to estimate on an evaporation of 35 lb. of water, from and at 212 deg. F., per hp., per hour. Knowing the feed-water temperature and the gage pressure in the boiler, it is possible to calculate the corresponding heat value of this evaporation and, allowing 2,545 B.t.u. per hp., estimate the boiler horsepower required.

Approximately, it is customary to allow 8 sq.ft. of heating surface, for plain cylindrical boilers; 10 sq.ft. of heating surface, for horizontal flue boilers; and 16 sq. ft. of heating surface, for horizontal tubular boilers, per horsepower.

Examination Questions Answered

Illinois Mine Managers' Examination Springfield, July 17, 18, 1922

(Selected Questions)

QUESTION—(*a*) *What is the law in reference to persons seeking certificates of competency as mine managers?* (*b*) *By whom and how often should a passageway to the escapement shaft be examined?*

ANSWER—(*a*) Section 2 of the Illinois Coal Mining Laws specifies that each applicant for a certificate of competency as mine manager shall produce evidence that he is a citizen of the United States, at least 24 years of age, and has at least 4 years practical mining experience, a man of good repute and temperate habits. He must also pass the examination required by the board covering his experience in mines and handling of men and knowledge of mine machinery and appliances, surveying and other instruments used in mining, properties of mine gases, principles of ventilation, first-aid treatment of injured, mine-rescue methods and appliances, and the duties and responsibilities of mine managers.

(*b*) Section 20 (a, 10), requires the mine manager or his assistant to examine, at least once a week, the roadways leading to the escapement shaft, or other openings for the safe exit of men to the surface, and make a record of any obstructions or unsafe conditions existing therein and cause the same to be promptly removed.

QUESTION—(*a*) *What are the provisions of the mining law in reference to air currents and splits.* (*b*) *Trolley or other exposed electrical wires.* (*c*) *Runaround at shaft bottom?*

ANSWER—(*a*) Section 14 (*b*) requires the main air current to be so split or divided as to give a separate current of reasonably pure air to every 100 men at work, and authorizes the inspector to give a written order for separate air splits for a smaller number of men.

(*b*) Section 17 (*b*) requires all trolley and positive feed wires, crossing places where persons or animals are required to travel, to be safely guarded or protected, in a manner to prevent contact of persons or animals.

(*c*) Section 10 (*i*) requires the construction of a safe passageway, free from all obstruction and dry as possible, around the bottom of a shaft where men enter or leave the cage, or must pass from one side of the cage to the other. This passageway must be 3 ft. wide; and the law forbids animals or cars to be taken through it when men are using the passage.

QUESTION—*A return airway is 10 ft. wide and 5 ft. high, the velocity being 600 ft. per min. The air is controlled by volume as follows: Nitrogen 79 per cent; oxygen 20.96 per cent; carbon dioxide 0.04 per cent. What number of cubic feet of each gas is passing per minute?*

ANSWER—The sectional area of the airway is 5 × 10 = 50 sq.ft., and the volume of air passing, 600 × 50 = 30,000 cu.ft. per min. The volume of each of the constituent gases is, therefore: Nitrogen, 0.79 × 30,000 = 23,700 cu.ft. per min.; oxygen, 0.2096 × 30,000 = 6,288 cu.ft. per min.; carbon dioxide, 0.0004 × 30,000 = 12 cu.ft. per min.

QUESTION—*A pillar of coal 450 ft. long and 132 ft. wide has been worked. The total weight of the coal is found to be 12,430 tons and its specific gravity is 1.25; what was the thickness of the seam?*

ANSWER—The area covered by this pillar is 450 × 132 = 59,400 sq.ft. The specific gravity of the coal being 1.25, its weight can be estimated as 1.25 × 62.5 = 78.125 lb. per cu.ft. The gross weight of coal mined being 12,430 × 2,000 = 24,860,000 lb., the cubic contents of the pillar worked out is 24,860,000 ÷ 78.125 = 318,208 cu.ft. Finally, the height of the seam is therefore 318,208 ÷ 59,400 = 5.35 ft.

QUESTION—*Find the length of a dumb drift, which is driven from a level 240 ft. from the shaft and enters the shaft at a point 100 ft. above the level.*

ANSWER—The dumb drift is the hypotenuse of a right triangle whose sides are 240 and 100 ft. respectively. Therefore, the length of the dumb drift is $\sqrt{100^2 + 240^2} = 260$ ft.

QUESTION—*What is the real object of artificial respiration?*

ANSWER—The object of performing artificial respiration on an unconscious person who has ceased to breathe is to re-establish breathing, by mechanically reproducing the action of the lungs, by alternate compression and extension of those muscles that control the breathing. Through this process, long continued, atmospheric air is drawn into the lungs, gradually inflating its vesicles and restoring life.

QUESTION—*What is meant by the terms* (*a*) *ventilating pressure,* (*b*) *water gage,* (*c*) *mine resistance?*

ANSWER—(*a*) The term "ventilating pressure" describes the pressure required to circulate the air in an airway or mine. The unit of ventilating pressure is this pressure expressed in pounds per square foot. The total ventilating pressure producing circulation is the total pressure exerted on the sectional area of the fan drift.

(*b*) The term "water gage" describes an instrument used to measure the unit of ventilating pressure, by showing the difference in height between the absolute pressure on the intake and that on the return airway by the height of water supported at the point where the gage reading is taken.

(*c*) The term "mine resistance" describes the work, in foot-pounds, absorbed in the circulation of air in a mine or airway. It is the total ventilating pressure multiplied by the velocity of the air current.

Number and Annual Output of Soft-Coal Mines Classified by Size of Mine, 1919 and 1920*

NUMBER OF MINES AND PRODUCTION DURING 1919

State	Class 1 Producing Over 200,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Class 2 Producing 100,000-200,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Class 3 Producing 50,000-100,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Class 4 Producing 10,000-50,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Class 5 Producing Less Than 10,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Total, All Classes: No. Of Mines	State Output
Alabama	15	5.0	30.2	30	10.0	27.1	43	14.4	18.8	129	43.3	21.9	81	27.3	2.0	298	15,536,721
Arkansas	...	....	....	2	1.8	16.9	4	3.6	17.2	34	30.6	51.0	71	64.0	14.9	111	1,429,020
California, Idaho and Alaska	...	....	....	...	....	....	...	....	....	1	7.0	60.0	13	93.0	40.0	14	67,228
Colorado	8	3.7	21.4	31	14.2	44.8	23	10.5	16.0	57	26.0	15.4	100	45.6	2.4	219	10,323,420
Georgia	...	....	....	...	....	....	1	100.0	100.0	...	....	....	...	....	....	1	53,337
Illinois	115	16.5	67.0	77	11.0	18.4	75	10.7	9.3	101	14.5	4.2	330	47.3	1.1	698	60,862,608
Indiana	23	5.0	34.0	52	11.4	34.9	54	11.7	18.3	85	18.6	10.5	244	53.3	2.3	458	20,912,288
Iowa	1	0.4	5.3	13	5.1	30.4	24	9.5	31.1	62	24.5	27.0	153	60.5	6.2	253	5,624,692
Kansas	...	....	....	8	3.7	19.6	31	14.2	43.9	48	22.1	29.1	130	60.0	7.4	217	5,224,724
Kentucky	15	1.0	15.6	69	4.5	30.7	116	7.6	27.7	253	16.5	21.6	1,079	70.4	4.4	1,532	30,036,061
Maryland	...	....	....	7	6.0	30.9	11	9.4	28.1	38	32.5	35.6	61	52.1	5.4	117	3,021,686
Michigan	...	....	....	3	17.6	42.2	5	29.4	39.3	5	29.4	17.8	4	23.6	0.7	17	996,545
Missouri	...	....	....	4	1.0	12.5	17	4.1	30.4	71	17.2	44.1	320	77.7	13.0	412	3,979,798
Montana	4	3.2	54.5	3	2.4	12.3	8	6.4	21.2	10	7.9	6.7	101	80.1	5.3	126	3,236,369
New Mexico	2	4.4	26.2	5	10.9	24.0	17	37.0	43.6	7	15.2	5.1	15	32.5	1.1	46	3,138,756
North Carolina	...	....	....	...	....	....	...	....	....	...	....	....	1	100.0	100.0	1	6,989
North Dakota	1	0.4	29.7	...	....	....	1	0.4	7.3	14	6.3	28.7	206	92.9	34.3	222	840,959
Ohio	33	2.0	26.2	83	5.0	33.3	86	5.2	17.5	254	15.2	17.2	1,213	72.6	5.8	1,669	35,876,682
Oklahoma	1	0.6	5.5	3	1.8	10.7	19	11.5	35.4	72	43.6	44.0	70	42.5	4.4	165	3,802,113
Oregon	...	....	....	...	....	....	...	....	....	1	25.0	76.1	3	75.0	23.9	4	18,739
Pennsylvania	229	6.8	46.9	224	6.6	21.6	319	9.4	14.8	827	24.5	13.6	1,778	52.7	3.1	3,377	150,758,154
South Dakota	...	....	....	...	....	....	...	....	....	...	....	....	17	100.0	100.0	17	14,417
Tennessee	3	1.8	12.5	9	5.4	24.5	21	12.7	30.0	68	41.2	28.3	64	38.9	4.7	165	5,213,205
Texas	...	....	....	2	3.9	16.9	9	17.6	30.4	30	58.9	50.7	10	19.6	2.0	51	1,680,656
Utah	11	20.8	76.6	6	11.3	18.3	1	1.9	1.7	4	7.5	2.6	31	58.5	0.8	53	4,631,323
Virginia	14	9.7	64.6	8	5.6	12.1	14	9.7	10.4	38	26.4	10.9	70	48.6	2.0	144	9,326,830
Washington	4	8.5	32.5	6	12.8	29.1	8	17.0	19.2	18	38.3	17.2	11	23.4	2.0	47	2,990,447
West Virginia	62	3.3	23.1	186	9.9	32.6	259	13.8	23.5	551	29.4	19.0	819	43.6	1.8	1,877	79,036,553
Wyoming	9	9.2	35.4	23	23.5	45.9	15	15.3	15.9	6	6.1	2.2	45	45.9	0.6	98	7,219,738
Grand total	550	4.4	37.5	854	7.0	26.0	1,181	9.5	18.1	2,784	22.4	15.3	7,040	56.7	3.1	12,409	465,860,058

NUMBER OF MINES AND PRODUCTION DURING 1920

State	Class 1 Producing Over 200,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Class 2 Producing 100,000-200,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Class 3 Producing 50,000-100,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Class 4 Producing 10,000-50,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Class 5 Producing Less Than 10,000 Tons: No.	Per Cent Of Total Mines	Per Cent Of State Output	Total, All Classes: No. Of Mines	State Output
Alabama	15	4.6	31.1	30	9.2	27.4	47	14.3	19.3	120	36.7	19.9	115	35.2	2.3	327	16,294,099
Arkansas	...	....	....	4	3.3	25.6	5	4.1	16.3	40	32.8	47.8	73	59.8	10.3	122	2,103,596
California, Idaho and Alaska	...	....	....	...	....	....	...	....	....	2	15.4	72.8	11	84.6	27.2	13	63,864
Colorado	15	7.4	35.7	31	15.4	33.6	28	13.9	16.7	52	25.7	12.5	76	37.6	1.5	202	12,278,225
Georgia	...	....	....	...	....	....	1	100.0	100.0	...	....	....	...	....	....	1	50,156
Illinois	166	25.4	77.8	87	13.4	13.9	53	8.1	4.7	90	13.7	3.0	258	39.4	0.6	654	88,724,893
Indiana	36	6.9	40.7	81	15.6	38.6	57	10.9	14.6	54	10.3	4.3	294	56.3	1.8	522	29,350,585
Iowa	4	1.8	15.9	23	10.5	41.2	25	11.4	22.2	56	25.6	17.2	111	50.7	3.5	219	7,813,916
Kansas	1	0.4	3.6	13	5.0	28.5	31	11.9	35.8	52	19.9	26.0	164	62.8	6.1	261	5,926,408
Kentucky	21	1.8	17.0	83	6.9	32.2	115	9.6	22.0	347	28.9	25.6	634	52.8	3.2	1,200	35,690,762
Maryland	...	....	....	9	4.7	29.0	27	14.1	43.1	36	18.7	23.6	120	62.5	4.3	192	4,065,239
Michigan	2	11.1	32.1	3	16.7	28.5	66	33.3	34.0	3	16.7	5.3	4	22.2	0.1	18	1,489,765
Missouri	2	0.6	7.6	10	2.9	23.9	21	6.1	25.8	69	20.1	33.7	242	70.3	9.0	344	5,369,565
Montana	7	6.6	65.9	5	4.7	13.3	6	5.7	10.5	13	12.3	7.7	75	70.7	2.6	106	4,413,866
New Mexico	3	7.0	30.0	16	37.2	52.5	5	11.6	11.1	9	20.9	5.6	10	23.3	0.8	43	3,683,440
North Carolina	...	....	....	...	....	....	...	....	....	1	100.0	100.0	...	....	....	1	11,340
North Dakota	1	0.6	25.8	...	....	....	2	1.2	12.9	15	9.6	34.6	138	88.6	26.7	156	948,625
Ohio	44	2.3	26.2	108	5.5	33.0	118	6.0	18.2	320	16.4	17.6	1,364	69.8	5.0	1,954	45,878,191
Oklahoma	...	....	....	8	4.9	17.9	40	24.9	43.3	56	34.8	35.2	57	35.4	3.6	161	4,849,288
Oregon	...	....	....	...	....	....	...	....	....	1	33.3	88.3	2	66.7	11.7	3	20,717
Pennsylvania	249	4.7	47.5	244	4.6	20.5	342	6.4	14.3	982	18.4	14.4	3,631	66.7	3.6	5,448	170,607,847
South Dakota	...	....	....	...	....	....	...	....	....	...	....	....	17	100.0	100.0	17	12,777
Tennessee	7	2.8	26.9	11	4.4	20.1	19	7.7	19.6	76	30.8	28.1	134	54.3	5.3	247	6,662,428
Texas	...	....	....	3	6.8	22.3	7	15.9	26.4	31	70.5	50.9	3	6.8	0.4	44	1,615,015
Utah	15	32.6	84.6	5	10.9	12.3	1	2.2	1.4	3	6.5	1.3	22	47.8	0.4	46	6,005,199
Virginia	14	6.1	54.1	16	6.9	18.9	21	9.1	13.3	50	21.6	10.9	130	56.3	2.8	231	11,378,606
Washington	5	10.2	39.8	8	16.3	35.0	6	12.2	10.8	20	40.9	13.1	10	20.4	1.3	49	3,757,093
West Virginia	74	3.5	23.3	213	10.1	31.7	289	13.8	23.6	651	31.0	19.7	875	41.6	1.7	2,102	89,970,707
Wyoming	20	24.1	62.4	20	24.1	29.6	7	8.3	5.3	11	13.4	52.4	25	30.1	0.3	83	9,630,271
Grand total	701	4.8	41.8	1,031	7.0	25.1	1,279	8.8	16.0	3,160	21.5	14.4	8,595	58.2	2.8	14,766	568,666,683

* Compiled by U. S. Geological Survey.

80,761,604 Tons of Coal Mined in 1921 in West Virginia; Value, $375,541,458

Official figures covering the production of coal in West Virginia for the fiscal year ending June 30, 1921, given in the seventeenth annual report of the West Virginia Department of Mines, just issued, show that there was produced in the period mentioned 80,761,604 gross tons of coal as against 79,991,316 tons for the preceding fiscal year, the gain amounting to 770,288 tons or less than 1 per cent. In the same period coke production amounted to only 836,728 tons, as against 1,172,217 tons for 1920, a decrease of 335,489 tons or 28.62 per cent.

The Department of Mines estimates that the total value of all coal produced in the 1921 fiscal year was $375,541,458.60, that the value of coal used in operating was $5,074,400.85; that the value of coal sold local trade and tenants was $7,144,297.20; that the value of coal used in coke ovens was $5,845,352.25; that the value of coal shipped from the mines was $354,222,408.30 and that the value of coal mined by small country mines was $3,255,000. It is estimated that the value of coal sold was $364,611,705.50 and that the value of coke sold was $8,015,854.24. The increase in value as compared with the previous year is as follows: for coal, $113,733,853.50; for coke, $560,554.12.

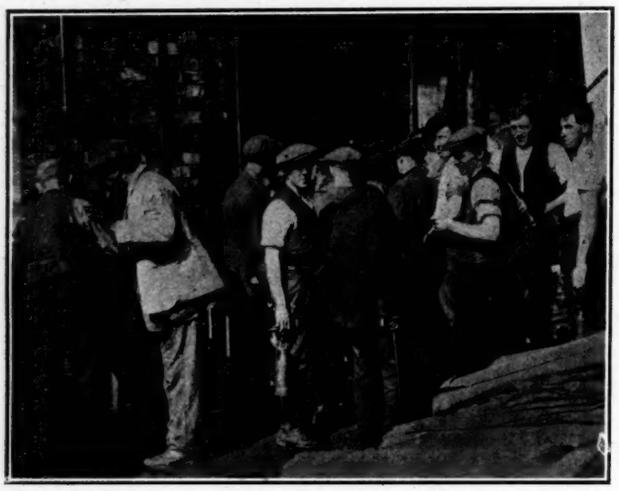
The department estimates that the average price received by pick miners throughout the state for mining run-of-mine coal was 95c. per ton, as against 91c. in 1920. The average tonnage produced by each pick miner was 1,227, a decrease of 368 tons from the fiscal year 1920. The average annual wage of pick miners was $1,165.65, that being a decrease of $285.80 from that of 1920. The average selling price of coal shipped from the mines of the state was $4.65 per gross ton, run-of-mine coal, which was an increase of $1.25 per ton over the price received in the preceding year. Coke was sold f.o.b. at the ovens during the year at an average price of $9.58 per net ton, which is an increase over the previous year of $3.22 per ton.

In the fiscal year ended June 30, 1921, there were 116,726 people employed in connection with the production of coal and coke. Of that number 17,140 were employed as pick miners, 39,522 as machine miners, 6,052 as machine miners and helpers, 32,778 as inside laborers, 20,184 as outside laborers and 1,050 as coke workers.

Local Explosion in England Takes Toll of Thirty-Nine Lives

A local gas explosion at the Haig Pit of the Whitehaven Colliery Co., Whitehaven, Cumberland, England, near the entrance to the Solway Firth at about 8:45 a.m. on Tuesday, Sept. 5, caused the death of 39 men. This pit was sunk about nine years ago, the shaft reaching the Sixquarter coal, a 5-ft. bed, at about 1,200 ft. Workings in this bed extended under the sea, and the point where the explosion was initiated was about ½ mile out from the shore line. The explosion affected only one split or ventilation district and the balance of the 112 men employed in the mine at the time of the explosion but not working on the split affected escaped without injury.

One phase of this disaster worthy of notice was the promptness with which rescue operations were started. The general manager was within the mine directing the work of rescue within 20 minutes after evidence of the explosion (a puff of air) was noticed on the surface. He was preceded by an under official who was overcome by gas and had to be



PARTY OF RESCUERS DESCENDING HAIG PIT AFTER EXPLOSION

This photograph was taken on Sept. 7, or about 48 hours, after a local explosion of gas had snuffed out the lives of 39 men. The bodies of about two-thirds of the victims were recovered within a day. Neighboring mines proffered all possible assistance and all the apparatus needed, but the victims of this disaster all met their death quickly and not a single man working on the split affected escaped.

rescued. The manager was later gassed and had to be carried out. Both these officials, however, recovered without sustaining permanent injury.

So rapidly did rescue work progress that some of the victims of the explosion were still breathing when reached, according to reports so far received. None of these survived or even regained consciousness. Of the 39 men killed about half met death through the violence of the explosion and the remainder succumbed to the irrespirable gases. Most of them died quickly, but some few crawled for short distances.

Midwest Coal Trade Associations Dissolve

The coal trade associations of Illinois operators have dissolved and in their stead commercial statistical services have been set up to collect, digest and disseminate data on production, distribution, cost and realization but omitting the troublous item of prices. By this means the various coal-trade bureaus clear themselves of any suggestion of illegality such as had been raised more or less vaguely against them. In the 5th and 9th Districts of Illinois, the association centering in St. Louis formally dissolved Sept. 1, though P. J. Greenlaw, former secretary, is retained by the operators to compile statistics, covering employees' hours and earnings, mine tonnage and other operating data, but with no reference to sales records. The Central Illinois Coal Bureau, at Springfield, disbanded a few days later, the members subscribing to Scott's Statistical Coal Service, conducted by O. G. Scott, former secretary. The Indiana associations have made no definite changes. The labor-handling associations of operators in both states are unaffected by these developments.

British Empire Steel Corporation and Coal Miners to Sign Agreement Soon

The new wage agreement between the British Empire Steel Corporation and the miners of District 26, U. M. W. of A., will not be signed for a week or ten days, according to a statement issued Sept. 18 by J. B. McLachlan, secretary-treasurer, when, after a week's negotiation, he signed the Inverness miners to the new contract, the same as that entered into with the British Empire Steel Corporation.

The new contract is practically the McKinnon award, which is considerably less than that paid under the Montreal agreement, under which contract the miners of Inverness have been working for the past month, but is somewhat higher than the rate of wages awarded the Inverness miners by the Osborne conciliation board. Under the conciliation board award the minimum day rate was $3.10, while under the new contract it is $3.25.

There is considerable work to be done in the matter of straightening out local contracts as well as getting the new rates that the men employed in the machine shops will work under. When this is done, Mr. McLachlan stated, the agreement will be signed.

Underground employees of the Western Fuel Corporation, Ltd., Nanaimo, B.C., are preparing the basis for a new agreement with their employers which, it is intended, shall subsist for three years on and from Oct. 1. Their desires have been placed in the form of a report which will be submitted to representatives of the management. The report is interesting not alone because of the several demands made but as illustrating the amicable relations that exist between the men and the company.

Provision is made for the permanent establishment of an agreement committee which, it is proposed, shall hold monthly meetings with a similar body delegated by the management. Before this joint agreement committee will come for settlement everything of a contentious nature.

At a mass meeting of the employees of the corporation held Sept. 16 it was agreed to accept the increase in bonus to the underground workers from the old rate of 88c. to $1. It was decided to reorganize a miners' union, the district having been without a union during the last two years. A committee was appointed with that object in view. A resolution was passed and a copy of it has been forwarded to the Minister of Mines, requesting that the Coal Mining Act be amended and made to exclude Oriental labor in and around the coal mines of the province. A large proportion of the employees of some of the companies working mines on Vancouver Island are Orientals. Another resolution was passed and a copy of it forwarded to John Oliver, Premier of the province, requesting that a system of state insurance be inaugurated.

Plan $50,000,000 Merger of Coal Retailers

Consolidation of retail coal companies in various cities into a national organization with a capital of about $50,000,000 is under way, according to a report current in financial circles. The nucleus of the organization will be the Burns Brothers Coal Co. which recently took over the William Farrell Coal Co. in New York City.

Negotiations already are under way, it is said, to take over the business of the Consumers' company of Chicago, the largest retail distributor of coal in that city. Other properties which are to be included in the consolidated company, according to the reports, include the Polar Wave Company, of St. Louis; the Metropolitan Coal Co., of Boston, and the Newton Coal Co., of Philadelphia.

The Burns Brothers company, according to an officer of the company, has approximately 3,000,000 tons of unfilled orders on hand.

Bill Creating U. S. Coal Commission Becomes a Law; Compromise Measure Provides for Seven Members

Appearing as a compromise from the conference committee of the two houses of Congress, after pressure had been exerted from high administrative quarters to break an apparent deadlock among the conferees, the bill to create the United States Coal Commission, which is to investigate the industry broadly, was enacted into law speedily on Friday, Sept. 22. The conference report was adopted by both houses on the same day and with very little debate.

In its final form the legislation provides for a commission of seven members, instead of the five proposed by the Senate bill and not more than nine provided by the House bill. Restrictions as to the personnel of the commission were removed in conference excepting that no member of the House or Senate may serve. An appropriation of $200,000 is provided, this sum being half way between the $300,000 of the House bill and $100,000 of the Senate bill.

The point which nearly wrecked the conference, that of inclusion in the Senate bill of instructions to the commission to report on "the advisability or wisdom of nationalizing the coal industry" and "the feasibility or necessity of governmental regulation and control of the coal industry," was compromised by rewriting these two subsections into one, reading "the advisability of any legislation having to do with government or private ownership, regulation or control in the coal industry."

This rewriting of the two subsections into milder form represents a considerable concession on the part of Senator Borah, author of the Senate bill, which was compensated to a large degree, however, by acceptance by the House conferees of the terms of the Senate bill instructing an inquiry and report on various forms of standardization, of wages, production, etc.

The act provides that the first report of the commission shall be presented to the President and to Congress not later than Jan. 15. It provides for a separate investigation of the anthracite industry, with a separate report on this field to be submitted on or before July 1. The life of the act is limited to one year. The salary of the commissioners is fixed at $7,500 annually and no employee of the commission is to be paid a salary in excess of this sum.

There was no record vote in either House on the adoption of the conference report. A motion to recommit to the House managers, with instructions to provide specifically for inclusion on the commission of representatives of the miners and of operators, which was made by Representative London, socialist, was defeated, 106 to 156.

Text of Fact-Finding Commission Bill

To establish a commission to be known as the United States Coal Commission, for the purpose of securing information in connection with questions relative to interstate commerce in coal, and for other purposes.

That for the purpose of securing information in connection with questions relative to interstate commerce in coal and all questions and problems arising out of and connected with the coal industry, there is hereby established a governmental agency to be known and designated as the United States Coal Commission, to be composed of not more than seven members appointed by the President of the United States by and with the advice and consent of the Senate. No member of the United States Senate or of the House of Representatives shall be eligible to serve on said commission. Said commission shall elect a chairman by majority vote of its members, shall maintain central offices in the District of Columbia, but may, whenever it deems it necessary, meet at such other places as it may determine. A member of the commission may be removed by the President for neglect of duty or malfeasance in office but for no other cause. Each member of said commission shall receive a salary of $7,500 a year. Any vacancy on the commission shall be filled in the same manner as the original appointment. Said commission shall cease to exist one year after the taking effect of this act.

The term "person" as used in this act means any individual, partnership, corporation, or association; the term "coal" means anthracite, bituminous, and other coal, lignite, coke, and culm, whether in place extracted, or banked.

It shall be the duty of said commission to investigate and ascertain fully the facts and conditions and study the problems and questions relative to the coal industry, with a view to and for the purpose of aiding, assisting, and advising Congress in matters of legislation which will insure a supply of this commodity to the industries and the people generally throughout the country and maintain the uninterrupted flow of commerce among the states, or any legislation which Congress may after said investigation deem wise and which under the Constitution Congress has the power to enact.

To this end said commission shall ascertain and report to the President and Congress: As to the ownership and titles of the mines; prices of coal; the organizations and persons connected with the coal industry; cost of production; profits realized by the operators or owners of said mines during the last 10 years; profits of other persons or corporations having to do with production, distribution, or sale of coal; labor costs; wages paid; wage contracts; irregular production; waste of coal; and suggestions as to the remedy for the same; the conditions generally under which coal is produced; distribution; the causes which from time to time induce strikes, thereby depriving interstate carriers of their fuel supply and otherwise interrupting the flow of interstate commerce; and all facts, circumstances, or conditions which would be deemed helpful in determining and establishing a wise and efficient policy by the government relative to said industry.

Said commission shall, under the provisions of this act, make a separate investigation and report for the anthracite industry, which investigation and report shall cover all of the matters specified in the last preceding paragraph, and shall cover also every other phase of the anthracite industry, including the production, transportation and distribution of anthracite, and the organized or other relationships, if any, among the mine operators or the mine workers, or among any persons engaged in the production, transportation, or distribution of coal.

Said commission shall also submit recommendations relative to:

(a) Standardizing the mines upon the basis of their economic productive capacity and regarding the closing down of mines which, by reason of their natural limitations, or other conditions, fall below the standard.

(b) Ascertaining and standardizing the cost of living for mine workers and the living conditions which must be supplied or afforded in order to surround the workmen with reasonable comforts, and standardizing also as far as practicable the amount of work a man shall perform for a reasonable wage, recognizing the value and effect of such surroundings in respect to their efficiency.

(c) Standardizing a basis of arriving at the overhead cost of producing and distributing the coal, including delivery at the door of the consumer, recognizing in this compilation that the standardized cost of living to the miners should be the first and irreducible item of expense.

(d) The advisability of any legislation having to do with government or private ownership, regulation, or control in the coal industry.

Said commission shall render its first report and recommendations to the Congress and to the President not later than Jan. 15, 1923. Said commission shall render its separate report on the anthracite industry on or before July 1, 1923, and shall endeavor, in said separate report and in the recommendations contained therein regarding wages in the anthra-

cite industry, to take into consideration the conditions obtaining up to the time when said report is made.

That any officer or employee of the commission who shall make public any information obtained by the commission without its authority, unless directed by a court, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by a fine not exceeding $5,000 or by imprisonment not exceeding one year or by both such fine and imprisonment in the discretion of the court.

That any member of said commission shall have power to administer oaths, to subpœna and examine witnesses, and to compel the production of any book, paper, document, or other evidence from any place in the United States at any designated place of hearing, and to take or authorize the taking of the deposition of any person before any person having power to administer oaths. In the case of a deposition the testimony shall be reduced to writing by the person taking the deposition or under his direction and be subscribed to by the deponent. The same fees and mileage as are paid in the courts of the United States shall be paid in the case of witnesses subpœnaed or depositions taken under this act.

No person shall be excused from so attending and testifying and deposing, or from so producing any book, paper, document, or other evidence on the ground that the testimony or evidence, documentary or otherwise, may tend to incriminate him or subject him to a penalty or forfeiture; but no natural person shall be prosecuted or subjected to any penalty or forfeiture for or on account of any transaction, matter, or thing as to which, in obedience to a subpœna and under oath, he may be compelled to testify or produce in evidence; except that no person shall be exempt from prosecution and punishment for perjury committed in so testifying.

Any member of the commission, officer or employee thereof, duly authorized in writing by the commission, shall, at all reasonable times for the purpose of examination, have access to and the right to copy any book, account, record, paper, or correspondence relating to any matter which the commission is authorized by this act to investigate.

That every officer or employee of the United States whenever requested by the commission shall supply it with any data or information pertaining to any investigation by the commission which may be contained in the records of the office of such officer or employee.

That any person who shall willfully neglect or refuse to attend and testify or depose, or to produce or permit access to any book, account, record, document, correspondence, or paper, as herein provided for, shall be guilty of an offense and upon conviction thereof be punished by a fine of not more than $5,000 or by imprisonment for not more than one year, or by both such fine and imprisonment.

That the commission may appoint and remove such officers, employees, and agents; and make such expenditures for rent, printing, telegrams, telephone, law books, books of reference, periodicals, furniture, stationery, office equipment, and other supplies and expenses, including salaries, traveling expenses of its members, secretary, officers, employees, and agents, and witness fees as are necessary for the efficient execution of the functions vested in the commission by this act and as may be provided for by Congress from time to time, and make such rules and regulations as may be necessary for the efficient administration of this act. All of the expenditures of the commission shall be allowed and paid upon the presentation of itemized vouchers therefor approved by the chairman of the commission. No salary or compensation of any employee shall exceed $7,500 per year.

That there is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $200,000, or so much thereof as may be necessary, to be available until expended, for carrying out the provisions of this act.

Preliminary Statistics of Production of Coal in 1921

(Exclusive of product of wagon mines)

ALABAMA

County	Loaded at Mines for Shipment (Net Tons)	Sold to Local Trade and Used by Employees (Net Tons)	Used at Mines for Steam and Heat (Net Tons)	Made into Coke at Mines. (Net Tons)	Total Quantity (Net Tons)	Total Value	Average Value per Ton	Number of Employees Underground: Miners, Loaders, etc., (a)	Number of Employees Underground: All Others	Number of Employees: Surface	Number of Employees: Total	Average Number of Days Worked
Bibb	616,709	6,112	21,171	.....	643,992	$2,277,000	$3.54	1,009	426	280	1,715	150
Blount	298,712	1,878	1,800	.....	302,390	1,073,000	3.55	437	62	136	635	177
Etowah	72,869	765	1,473	.....	75,107	233,000	3.10	147	35	44	226	172
Jefferson	5,585,362	91,138	167,338	20,637	5,864,475	17,385,000	2.96	6,468	3,067	1,757	11,292	173
St. Clair	622,355	5,029	18,828	.....	646,212	2,123,000	3.28	509	202	124	835	203
Shelby	429,614	7,670	23,212	.....	460,496	1,903,000	4.13	681	227	181	1,089	192
Tuscaloosa	411,514	7,209	11,958	107,721	538,402	1,624,000	3.02	1,053	340	229	1,622	129
Walker	3,685,128	191,487	43,269	.....	3,919,884	11,670,000	2.98	4,816	1,450	1,827	8,093	158
Winston	33,150	.....	.....	.....	33,150	86,000	2.59	89	32	25	146	181
Other counties (b)	79,196	1,837	3,758	.....	84,791	339,000	4.00	95	28	33	156	142
Totals	11,834,609	313,125	292,807	128,358	12,568,899	$38,713,000	$3.08	15,304	5,869	4,636	25,809	166

ARKANSAS

Franklin	157,876	1,139	5,031	.....	164,046	$610,000	$3.72	245	95	57	397	108
Johnson	57,576	318	898	.....	58,792	253,000	4.30	250	96	82	428	48
Logan	64,495	9,429	1,038	.....	74,962	422,000	5.63	185	68	29	282	139
Sebastian	801,506	2,218	23,097	.....	826,821	3,334,000	4.03	1,470	485	217	2,172	117
Other counties (c)	93,131	6,373	3,652	.....	103,156	741,000	7.18	165	104	68	337	149
Totals	1,174,584	19,477	33,716	.....	1,227,777	$5,360,000	$4.37	2,315	848	453	3,616	112

COLORADO

Boulder	758,370	46,610	46,706	.....	851,686	$2,573,000	$3.02	615	325	178	1,118	166
Delta	69,735	20,200	.....	.....	89,935	259,000	2.88	58	14	25	97	147
Elbert, Jackson and Jefferson	167,897	4,829	8,301	.....	181,027	563,000	3.11	136	57	42	235	177
El Paso	159,950	122,232	6,349	.....	288,531	847,000	2.93	192	68	67	327	155
Fremont	535,898	47,991	6,932	.....	590,821	2,695,000	4.56	803	302	201	1,306	165
Garfield	6,962	9,833	.....	.....	16,795	68,000	4.05	14	3	3	20	188
Gunnison	445,993	4,704	28,310	.....	497,007	1,728,000	3.61	378	170	174	722	154
Huerfano	1,718,620	16,331	20,799	.....	1,755,750	7,174,000	4.09	1,634	725	629	2,988	192
La Plata	75,879	12,568	704	10,502	99,653	316,000	3.17	99	43	28	170	157
Las Animas	2,593,320	35,342	48,940	50,111	2,727,713	9,179,000	3.36	3,050	1,166	796	5,012	157
Mesa	96,461	14,700	2,600	.....	113,761	407,000	3.58	110	39	41	190	158
Moffat, Montezuma, Ouray, Pitkin and Rio Blanco	.....	10,992	.....	.....	10,992	42,000	3.82	18	4	3	25	182
Routt	826,207	8,968	53,840	.....	889,015	3,718,000	4.18	728	233	260	1,221	104
Weld	953,321	44,516	30,237	.....	1,028,074	2,808,000	2.73	621	301	176	1,098	184
Totals	8,408,613	399,816 (b)	253,718	60,613	9,122,760(d)	$32,377,000	$3.55	8,456	3,450	2,623	14,529	164

(a) Includes also shotfirers. (b) Cullman and Marion. (c) Pope and Washington.
(d) In addition to the above, 14,869 tons were produced by small mines and sold to local trade. The total production of the state was, therefore, 9,137,629 tons and the total sold to local trade and used by employees was 414,685 tons.

Statistics compiled by L. Mann, U. S. Geological Survey, Sept. 16, 1922.

Harding Signs Coal Distribution Bill and Names C. E. Spens as Federal Fuel Distributor

President Harding signed the Coal Distribution Act and appointed Conrad E. Spens Fuel Distributor, Sept. 22. The selection of Mr. Spens meets with general approval among representatives of operators, wholesalers and railroad executives. Mr. Spens is regarded as one of the outstanding traffic men of the country. He has been given leave of absence by the Chicago, Burlington & Quincy Railroad Co., of which he is vice-president. The appointment was made by the President on the recommendation of Herbert Hoover, Secretary of Commerce. Mr. Hoover had ample opportunity, while serving as food administrator, to become familiar with Mr. Spens' ability. Mr. Spens was chief of the traffic division of the Food Administration throughout its existence.

The new Fuel Distributor will have as his chief assistants Donald Conn, who is a specialist in the Lake trade and the requirements of the Northwest, and F. R. Wadleigh, chief of the coal commodity division of the Department of Commerce. Mr. Spens expects to expand the organization which was maintained during the period of voluntary distribution. For the present the Fuel Distributor will occupy the same quarters as were occupied by the voluntary distributor, but Secretary Hoover states that the organization soon will outgrow the floor space available at 718 Eighteenth Street.

Says States Have Principal Control Over Price

One of the first acts of the new distributor was to telegraph the governors to emphasize the fact that the principal control over price must be exercised by the state authorities and that federal control can be applied only to coal which moves in interstate commerce. The text of Mr. Spens' telegram is as follows:

"The federal act signed by the President the 22nd instant provides that it shall be the duty of the Federal Fuel Distributor, among other things, to ascertain in which parts of the United States there shall be a shortage of coal and the extent of such shortage; the fields of production and principal markets to which such production is to be transported and distributed; the prices normally and usually charged for such coal and whether current prices, considering the costs of production and distribution, are just and reasonable; the nature and location of consumers, and what persons, regions or community should receive priority in transportation and distribution, and the degree thereof.

"The federal government can exert its influence on distribution and restrain extortion only so far as concerns coal that may be transported from one state to another.

"It has no jurisdiction as to: (1) Coal produced and sold within the state of its production. (2) Retail or wholesale margins or handling coal within these states.

"Responsibility as to these features must rest with the state authorities and if profiteering in coal is to be prevented, except as to coal that may be moved across state lines at extortionate prices, the proper remedy must be applied by state authorities.

"Coal production capacity exceeds transportation capacity. The problem of adequate supplies and diminished prices is therefore primarily a problem of transportation. The federal authorities, in co-operation with the carriers, are making every possible effort to expedite movements. Coal today enjoys the same priority in transportation as food and feed. Transportation of coal is ample to meet current necessities, but is not sufficient to permit stocking either by household or commercial consumers and possibly will not be ample for that purpose for another sixty to ninety days.

"It appears necessary that state organizations or agencies be created in states where they do not now exist that will invite co-operation, that will prevent stocking of coal beyond current necessities and that will establish reasonable margin for retailers and wholesalers.

"As above stated, the constitutional authority of the federal government is limited, but it will gladly co-operate with these state governments as far as it can properly do so. The major responsibility, however, for the price at which the coal is sold to the consumers by the wholesalers or retailers within the state must rest with the state authorities.

"The federal act is, of course, nationwide in its scope and I am, therefore, addressing this communication to the governors of all states and to the State Fuel Administrations, where such agencies now exist, although I understand there is considerable territory in the United States where there is no imminent coal shortage nor complaint as to the cost of this commodity. We shall depend upon the judgment of the state authorities in each state as to whether or not the aid of the federal government is desired or necessary as to interstate coal.

"I would appreciate early advices from you as to the situation in your state and the measures taken or contemplated to meet the emergency."

Donald D. Conn, of Minneapolis, who has been named as Assistant Federal Fuel Distributor, has been stationed in Washington for some time as chairman of a special committee appointed by the governors of seven Northwestern States to represent them in connection with the coal-supply situation.

C. P. White, of St. Paul, Minn., has been designated as assistant to the Fuel Distributor in handling the fuel situation in the Northwest. Mr. White acted in a similar capacity in the later days of the President's Fuel Committee.

C. J. Hepburn, of Philadelphia, has been retained as general counsel to the Federal Fuel Distributor.

F. R. Wadleigh, chief of the coal division of the Department of Commerce, will act as an assistant to Mr. Spens.

E. M. Durham, of the American Railway Association, was directed to Philadelphia Monday to represent Fuel Distributor Spens at the sessions of the Committee of Anthracite operators and Pennsylvania state officials who are considering the problem of the distribution of anthracite.

H. M. Griggs, of the Cleveland Ore & Coal Exchange, who has been handling the movement of lake coal, will continue in this capacity.

It is planned by Fuel Distributor Spens to name special

MADE NEW FUEL DICTATOR

Conrad E. Spens, of Chicago, Ill., vice-president of the Chicago, Burlington & Quincy R.R., who has been appointed Federal Fuel Distributor by President Harding under the provision of the new coal-distribution and anti-profiteering law.

advisory committees, representing the general business and transportation interests of the country.

The following statement, outlining his tentative policies has been issued by the Fuel Distributor:

"In view of the fact that I have only today assumed the duties of Federal Fuel Distributor, I am not prepared to announce definite plans for execution of the provisions of the recent act of Congress. I do, however, at this time invite, and hope to secure, the co-operation of the entire public to the solution of the coal situation.

"The coal production capacity of the country is ample to meet all demands. The immediate problem is transportation, and this demand on the railroads for abnormal transportation of coal due to the miners' strike comes at a time when for well-known reasons the physical capacity of the railroads is subnormal, and at a time when the offerings of tonnage of all character are great. We understand, however, that the railroad situation is daily improving, and feel confident that the carriers are exerting and will continue to exert extraordinary efforts so that what otherwise might become a serious situation will be avoided. The result of concerted action during the next thirty days on part of all carriers—not only the carriers that originate the coal but also carriers that participate in the haul of loads and empties—will, we feel sure, serve to ameliorate the present apprehension of the administration as well as of the public.

Consumer as Well as Carrier Must Co-operate

"The co-operation of the consumer is practically as important as that of the carrier. At the request of the administration, Julius H. Barnes, president of the Chamber of Commerce of the United States, has addressed American industries, commercial and trade organizations urging that purchases of coal under present conditions be confined closely to current needs and that there be no accumulation of stocks of coal moving under contract or otherwise. I would like to add my appeal to that of Mr. Barnes', but will direct by appeal not only to the 'industrial' consumer but also to the 'domestic' consumer.

"Sufficient coal can be moved for current consumption, but sufficient coal cannot be moved within the immediate future to equalize the deficit that obtains and provide a surplus above immediate needs. The inconvenience of frequent purchases is small compared with the distress that might be suffered by an unequal distribution due to exaggerated anxiety or lack of neighborly consideration.

"If all consumers of coal, whether domestic or industrial, will calmly consider this appeal and will co-operate as suggested, not only will their current needs be taken care of but the result will be reflected quickly in the price of coal, which today in many sections of the country manifestly exceeds a fair-profit basis.

"The administration is not suggesting that the operator in coal shall sell his coal at cost. Nor is it suggesting that he shall sell his coal at less than cost. The administration is, however, indicating, and the present act of Congress contemplates, that he shall sell his coal on a basis that will not yield an abnormal profit; in other words that he shall not take an undue advantage of the present unfortunate economic situation.

"Many coal operators are co-operating in a splendid manner. Regretfully I must add that there are some who are not. Is it asking too much that, during these critical times, untoward speculation in an important necessity to comfort—to life itself—must cease, and that there be only legitimate merchandising, based on American standards of fair play?"

In announcing Mr. Spens' appointment the President made public a letter which he had written to the new distributor. It reads:

"I am appointing you to the responsible position of Federal Fuel Distributor under the act just passed by Congress, and I earnestly express the hope that you will direct your first attention to the further extension of the co-operative arrangements with the railways, the coal-producing and coal-consuming communities and the state authorities which have been initiated by the Secretary of Commerce and Mr. Spencer, the temporary Fuel Distributor. These arrangements, of voluntary origin, are already having a large effect in mitigating the situation.

"The arrangements set up for the distribution and control of price at last year's levels in the anthracite industry have been satisfactorily established in co-operation with the state authorities and the coal operators.

"The producing capacity of our bituminous mines is far beyond the public need; but the limiting factor in the supply is solely transportation. The Interstate Commerce Commission has given complete priority on the movement of coal, equal only with agricultural produce and some other necessities. But beyond these provisions I have the feeling that if we could stimulate the enthusiastic and organized personal attention not only of our railway executives but of the entire operating personnel of the railways, to a concentrated drive for a period of thirty days, on the movement of coal and the handling of 'empties,' we could solve the coal situation, not only as to ample supply but prices would be quickly readjusted.

"The authority of the federal government under the act is limited to coal moving in interstate commerce, and, therefore, can only be effective in control of distribution and prevention of extortion as a supplement to the activities of the state authorities. The governors of the various states already have, at the request of the federal administration, created state coal commissions, and I trust, therefore, you will take up definitely with them plans for co-operating under the new act.

"The federal government is loath to undertake to fix definite prices for coal, because of the objectionable character of such intervention in peace times, because of the difficulty in arriving at fair prices without giving undue favor to some and loss to others, and also because of the incompleteness of an authority which is only supplementary to state action. On the other hand, I wish you to set up such agencies as will vigorously follow up individuals using facilities of interstate commerce who are exacting extortion, as defined in the act, in order that we may have relief from such practices at the earliest moment.

"I trust that the measures initiated to secure co-operation of the responsible coal operators and dealers can be made effective in prevention of such profiteering. Likewise the organization started among the consuming community to co-operate by delayed purchasing of reserves until transportation increases will aid in restoration of normal prices and distribution.

"It would be far more agreeable to our national sense to solve these matters by co-operation rather than by regulation, and I trust you will find that all elements in the community will join with you in this purpose."

The President addressed the following letter to A. B. Spencer:

"I regret that you are not able to longer continue as Federal Fuel Distributor. I recognize of course that you have already overserved the period which it was hoped would be necessary when you undertook the work and I appreciate that your responsibilities in other service cannot longer be avoided.

"I wish to express to you the appreciation I feel and that the public must feel for the service you have performed in tiding over a critical situation. The fact that on a small fraction of our coal production you have secured its distribution so as to maintain the performance of all of our railways and public utilities is in itself evidence of great service."

Frisco Railroad Buys Contract Mine-Run At $2.225 Per Ton

The Frisco R.R., it is understood, has contracted with the St. Louis & O'Fallon Coal Co. for 700 tons per day of standard mine-run coal at $2.22½ per ton, and also for a small tonnage of 1¼ x 2½ nut coal at $2.55 per ton. This is the cheapest contract made in that section and operators generally cannot understand how such a low price could be made on a contract that will expire next March.

Service Order 25, Issued Sept. 19, Allows Broader Priority in Coal Movement

Shifting its policy from priorities on coal cars to a broader priority on coal transportation, the Interstate Commerce Commission on Sept. 19 amended Service Orders 23 and 24 and supplanted them with Service Order 25, which removes classifications 1 to 5 for coal-car loading and directs the carriers to observe a priority in movement of open-top cars in which coal ranks with road and building materials, ore, mine supplies and fluxing stone when the movement is in the direction of coal mines. The way is left open, however, for the commission to direct special car priorities if occasion arise.

The Interstate Commerce Commission explains the need of the order and outlines the purposes which it intends to accomplish as follows:

"By reason of certain embargoes issued by carriers, complaints have been made that various commodities, which in the public interest should be handled currently and promptly, have not been so handled. In addition to the commodities specified under Service Order No. 23 this order adds mine supplies, medicines, fertilizers, seeds, newsprint paper and petroleum and its products in tank cars to the list of commodities to be given preference and priority in movement, when carriers are currently unable promptly to transport all freight traffic offered to them for movement. The words 'fuel oil' as used in Service Order No. 23 are changed to read 'other fuels.'

"Service Order No. 23 directed all carriers to discontinue the use of open-top cars suitable for the transportation of coal for the transportation of commodities other than coal so long as any coal mine remained to be served with such cars. There are extensive road-building projects with uncompleted gaps, which, in the public interest, should be completed before cold weather sets in and for which appropriations have been made by the states and by the federal government. There are large building programs under way which must be completed without undue delay to avoid serious loss.

"Service Order No. 25 permits the use of open-top cars suitable for the loading and transportation of coal, after the discharge of the coal lading thereof, for the transportation of road and building-construction materials, ore, mine supplies for current operation and fluxing stone for furnaces when the destination of such commodities is in direction of but not beyond the mine or mines to which such open-top cars are destined for coal-loading, and when such use will not materially delay or minimize the production and transportation of coal. Carriers are directed to place an embargo against the further placement of open-top cars for loading with such commodities for any shipper who shall fail or refuse to load the open-top cars within 24 hours after placement for such loading thereof and are directed to place an embargo against any consignee who shall fail or refuse to unload such cars within 24 hours after placement.

"The order further cancels the priority afforded consumers now embraced in class 2 in paragraph 7 of Service Order No. 23. The production of bituminous coal has increased to approximately nine and one-half million tons per week, and should, with reasonable use, take care of current needs, if panic, undue storage and waste of fuel and equipment are carefully avoided. The commission therefore feels that it can now relax its previous order by omitting general priorities by classes of consumers, reserving, however, the right in special cases of great emergency to direct carriers to furnish any coal mine with such open-top cars as may, in the public interest, from time to time be designated by it or its agent therefor. By virtue of the general priority which is given both to movement and use of open-top cars for coal, the effect of the change now made is to advance all coal into the priority class, instead of only those classes of consumers formerly embraced in the priority designations. While it was necessary during the period of extremely limited production to give priority in use to certain highly essential classes, this necessarily involved deferring others. Under existing circumstances, it is believed that the course now taken will tend to a considerable improvement in the production of coal by facilitating its movement and general distribution. It will be necessary, however, to avoid a return to priority classifications, for continued efforts looking to the avoidance of overstocking, of delay to equipment, and to the curtailment of demand to meet bare daily necessities until the reserve of coal in circulation can once more be built up.

"Service Order No. 24, which now requires carriers west of the Mississsippi River to afford priority in movement to certain commodities, and for the return movement of empty cars for such loading, has been amended to correspond with Service Order No. 25, applicable in eastern United States. Service Order No. 22, as to routing of freight to avoid congestion, remains in effect."

Service Order No. 24, which provides for the priority in movement of certain commodities in the territory west of the Mississippi River, has been amended so as to enlarge the list of commodities. Paragraph 1 of that order, as amended, reads as follows:

"That each such common carrier by railroad, to the extent that it is currently unable promptly to transport all freight traffic offered to it for movement, or to be moved over its line or lines of railway shall give preference and priority to the movement of each of the following commodities: Food for human consumption, feed for live stock, live stock, perishable products, mine supplies, medicines, fertilizers, seeds, newsprint paper, coal, coke and other fuel and petroleum and its products in tank cars."

C. J. Neal Named Ohio Fuel Administrator; Fair Coal Prices to Be Established

Governor Harry L. Davis has named Clarence J. Neal of Cleveland as state fuel administrator following the passage of the price control law by a special session of the Ohio General Assembly. At the same time the Governor announced that "fair coal prices" will be established under the new law as soon as the necessary machinery can be set up. Mr. Neal is a business man and during Governor Davis' administration as Mayor of Cleveland served as city director of finance. During the war and the attending coal shortage he was placed in charge of distribution direct to the public in the City of Cleveland.

The first act of the new administrator was the naming of Clifford Gilversleeve, of Cleveland, as assistant and Frank H. Bear, also of Cleveland, as transportation director.

Illinois May Send Delegation to Lewis' Cleveland Conference

Though they did not agree to do so in their Aug. 22 contract with the miners, operators of Illinois are figuring on sending men to the Cleveland conference, Oct. 2, called by John L. Lewis, president of the United Mine Workers of America. At that conference Lewis hopes to start the machinery of wage-making for the period after April 1, 1923. The operators of the 5th and 9th Districts of Illinois have already decided they will be represented. The other two Illinois operators' associations will meet in Chicago Friday, Sept. 28, to decide their course. It is generally expected, among operators, that a delegation will go. The delegation may point to the creation of a fact-finding commission by President Harding, contending that no parallel commission such as Lewis wants should be set up.

Colonel L. E. Tierney Dies Suddenly

Colonel L. E. Tierney died last week at his home in Powhatan, W. Va., after an illness of two days. Colonel Tierney was prominent in politics in West Virginia and at one time was on the Governor's staff in that state, which accounts for his military title. He was a director of the Crozer Pocahontas Coal Co., vice-president and general manager of the Powhatan Coal & Coke Co., the Clinchburg Coal & Coke Co., the Eureka Coal & Coke Co., and general manager of the Elk Ridge Coal & Coke Co. The product of the four latter companies was sold by the Crozer Pocahontas Coal Co.

Anglers May Tell Their Fish Stories, but Can Anybody in the Coal Industry Beat These Illinois Whales?

This Bell & Zoller chunk from Zeigler No. 1 mine had its troubles. First it was undercut eight feet wide and seven feet deep with a shortwall machine. A heavy wooden skid was placed under it and all three sides sheared by hand. Then the whole piece was wedged down from the top onto the skid. When it was pulled from the seam the lump of fuel measured 8 x 7 x 4½ ft., but in loading, nearly half of it broke off, leaving the piece pictured here, a cube measuring 4½ ft. and weighing 6,800 pounds. It was shipped to the People's Coal Co. of Omaha, Neb. In the picture, left to right, are: Joseph Yerly, superintendent of Zeigler No. 1; E. L. Berger, superintendent, and William Cowell, manager, of No. 2; Paul Weir, chief engineer (front) and Mr. Bosworth.

"Biggest chunk ever mined" is the claim made for this neat little pellet by the Peabody Coal Co., whose men took it from the Peabody No. 3 mine near Marion, Ill. It measures 5½ x 5½ x 8 ft. and weighs 20,322 pounds. It was undercut by machine, handcut all around and drawn out of the seam on skids. Then it was turned over on its side on heavier skids and trussed up in planks and steel strap. Rails were greased, a block and tackle employed and the chunk was slid laboriously to the bottom and hoisted in a cage from which all rigging had been taken. The chunk was shown at last fall's American Mining Congress in Chicago. Nobody ever figured how much it cost. Another chunk of the same size was broken in the mine before this one was taken out whole.

This pillar of potential fire cost the Taylor Coal Co. $2,000 to remove from its No. 5 mine in Franklin County, Illinois, and put in a display at the 1921 Chicago Pageant of Progress. A crew of experienced old miners picked it out of a seam 11 ft. 8 in. thick, packed it in planks and baled hay, skidded it along greased track to the mine bottom, with power from a single locomotive, de-rigged the cage to handle it, hoisted it, loaded it in a car of screenings and lost hardly a pound. After safe movers in Chicago had charged $600 for moving it half a mile and placing it, the pillar measured 4 x 4 x 11 ft. and weighed 7½ tons. After the Pageant somebody stole it—but not in one piece.

Vancouver Island Mine Safety Association Has Mine-Rescue and First-Aid Contests

The Vancouver Island Mine Safety Association held its seventh annual field day of mine-rescue and first-aid competitions on the Central Sports Grounds, Nanaimo, B.C., Sept. 4. Twenty teams competed—five in mine-rescue work, eight in senior first-aid work, four in ladies' competitions, and three in junior first-aid work.

In the mine-rescue work the problems were drawn from sealed envelopes, and the teams were allowed twenty minutes to study them before commencing work. The mine had been laid out so that a full view could be had from the grandstand.

The results of the mine-rescue competitions for the V. I. M. S. A. shield were: Newbury's team (Western Fuel Corporation), Nanaimo, first; No. 3 team, Canadian Collieries (Hunter, captain), Ladysmith, second; No. 2 team, Western Fuel Corporation (Barton, captain), Nanaimo, third. The third prize, donated by the Kohler Manufacturing Co., of Vancouver, consisted of six handsome aluminum safety lamps.

Owing to a heavy downpour of rain it was necessary to hold the first-aid competitions in Odd Fellows' Hall, the first event being for the British Columbia Department of Mines Cup (first and second prizes). Barton's team (Western Fuel Corporation), Nanaimo, won first prize and R. Shields' team (Lantzville Collieries) won second.

After lunch the W. L. Coulson Cup was competed for. Barton's team won the first prize, and No. 1 team of the Canadian Collieries, Ladysmith, with J. Delaney as captain, was second. There was keen competition for second place between the South Wellington team and Delaney's team and it took the judges considerable time to arrive at a decision in favor of Delaney's team.

The ladies' first-aid event for the V. I. M. S. A. shield (first and second prizes) was next, and after a hard struggle was won by Mrs. Scott's team, of Nanaimo. Mrs. Covert's team, of Cumberland, was second.

The one-man event was won by Calvert Beck and Evan James (patient), of Nanaimo, Brown and Ferguson (patient) being second.

In the junior competition for the V. I. M. S. A. Cup, the Ladysmith team of the Canadian Collieries came first, and Nanaimo team (Gard, captain) second.

The two-man event was won by Barton, Stobbart and Brown (patient), of the Western Fuel Corporation. McDonald, Aman and Delaney (patient), of the Canadian Collieries, Ladysmith, came in second.

The judges for mine-rescue work were Robert Stracham, of Fernie, of the inspection staff of the British Columbia Mines Department, and Inspector J. Biggs of Merritt, B.C. The judges of first-aid work were Drs. D. McLellan, Sutherland, Carson, Lees, Kennedy, Perry, Wilkes, Mrs. Wilson, president of St. Johns Ambulance Brigade, and Miss Prideaux, a graduate nurse, all of Vancouver, B.C.; also Drs. Ingham, Hall, Moore and McPhee, of Nanaimo; Mr. Schofield, first-aid expert and lecturer, of Vancouver, and Mr. Cairnes, of Nanaimo.

In the absence of William Sloan, who was ill, John Hunt, general manager of the Western Fuel Corporation, distributed the prizes. He congratulated the teams on the splendid work done. After the presentations a large crowd adjourned to the dance hall, where a big crowd enjoyed themselves into the wee sma' hours.

The recent accident at Cumberland prevented participation in the contests of any teams from there, some of the members being in the hospital.

"IS THIS WIRE LIVE? I'll touch and see." They wrote on his gravestone: R.I.P.

JUST THINK, this time last summer our chief anxiety was, would the pressure of the coal burst out the side wall of the bin!—*New York Evening Post.*

Grand Jury Indicts 214 for Herrin Horror and Reports To the Court Without Fear or Partiality

The activity of the law in the Herrin case is a "private persecution by a political boss and a labor-hating organization," according to a public statement issued from Marion, Ill., by A. W. Kerr, chief counsel for the United Mine Workers of America. He charges Attorney General Brundage with trying the case in the press and influencing the grand jury by that means and suggests that the grand jury's report was written by the Illinois Chamber of Commerce, which is raising money to finance the investigation. Kerr injects a play for the sympathy of Governor Len Small and his political machine by stating that Brundage conducted a "political trial" in the courts against Small last spring that "resulted in the death of the first lady of the state."

The special grand jury which for a month has been investigating massacre of nineteen non-union miners and the wounding of thirty others near Herrin, Ill., on June 22, last Saturday reported back to the judge. It brought in enough indictments that day to swell the total in the case to 214—forty-four of them for murder, fifty-eight for conspiracy to commit murder, fifty-four for assault to murder and fifty-eight for conspiracy and rioting—and rendered a report notable for its impartial and fearless tone. Among those indicted for murder are Hugh Willis, state executive board member of the union in Illinois, and Will Davis, secretary-treasurer of the Herrin local.

Thirty-five of the defendants were arraigned and pleaded not guilty Monday. Eight charged with murder and considered ringleaders were refused bail. Six were bonded for $20,000 each, twenty for $10,000 each and eighteen for $5,000 each. Several charged with rioting are already out under $1,000 bonds. The eight men refused bail are Otis Clark, Bert Grace, James Brown, Leva Mann, Philip Fontanetta, Pete Miller, Oscar Howard and Jess Childers. Howard and Childers have not been apprehended. Eighty-six men, from bankers to small storekeepers, provided the bail. These included most of the prominent men of Herrin, encouraged by Mayor Pace of that town, who marshalled them by saying this would be a good way of showing who was for and who against the miners' union.

The jury blames the Southern Illinois Coal Co. for its "foolhardy" efforts to operate a non-union mine under armed guard in the midst of such intense union sympathies as prevail in Williamson County. It blames President Lewis and officers of the miners' union for the broadcasted and inflaming Lewis message saying the strip miners were "strike breakers and should be treated as such." It blames the county sheriff, Melville Thaxton, a union member and candidate for county treasurer, for being derelict in his duty for his own political benefit. It charges Adjutant-General Carlos Black, of the Illinois National Guard, with equal dereliction of duty for failure to rush state troops into the county when it was plain that violence was about to be done. It condemns the local police for laxity and makes several other findings indicating the desire of the jury to lay a solid foundation for the enforcement of justice in the prosecutions that may now begin.

The text of the grand jury report follows:

We the special grand jury of Williamson County empaneled to make an investigation of the crimes committed in and about the strip mine near and in Herrin on Wednesday and Thursday, June 21 and 22, 1922, and heedful of the instructions given by your honor to make a thorough investigation of the facts and circumstances, with a view of fixing the responsibility for the killing of some twenty-four persons and the wounding of many others, beg to report that we have examined approximately 300 witnesses and from their testimony learned these conditions:

About the middle of June of this year, after suspension of the coal industry as the result of a strike of the United Mine Workers of America, the Southern Illinois Coal Co. decided to operate a strip mine owned by it and located about midway between Marion and Herrin.

The miners' union apparently raised no objections to the uncovering of the coal by the use of steamshovels, but when the company began to ship coal there was bitter resentment on the part of the union miners.

The coal company aggravated this resentment by employing armed guards and closing for the public use certain established highways traversing the mine property and treating as trespassers citizens attempting to use the accustomed highway.

The flaunting of arms in a community devoted almost exclusively to mining was conducive to strife; it was a challenge certain to be accepted, and for four or five days preceding the tragedy it was known by the authorities that a conflict was inevitable.

The state administration undoubtedly realized the acute situation by sending to Williamson County Colonel Hunter of the adjutant general's staff. This representative of the state government testified that he recognized upon his arrival in Marion the imminence of a conflict and immediately asked the adjutant general to send state troops to protect the property and conserve the peace.

This request Colonel Hunter renewed several times before the actual conflict, and was invariably asked by the adjutant general of Illinois if the sheriff of Williamson County had asked for troops. The adjutant general denied his authority to order them into Williamson County except upon the sheriff's request, which, as your honor knows, is not the law.

Melvin Thaxton, the sheriff of Williamson County, is the holder of a card in the miners' union and a candidate for County Treasurer at the forthcoming election.

Either because of loyalty to the union or from fear of injuring his candidacy the sheriff would make no demand for troops nor did he take adequate measures to preserve the peace.

From the evidence heard, the attack of June 21 upon the men employed at the strip mine was the result of a conspiracy which had several days in the perfecting, the object of which was the closing of the strip mine.

Sheriff Thaxton could not have been unaware of the development of this plan.

On Monday, June 19, State Senator W. A. Sneed, district president of the United Mine Workers of this district, received from John L. Lewis, president of the United Mine Workers of America, a telegram as follows:

"William Sneed, President, Sub-District 10, District 13, United Mine Workers of America, Herrin, Ill.: Your wire 18th. Steam Shovel Men's union was suspended from affiliation with American Federation of Labor some years ago. It was ordered suspended from the mining department of the A. F. of L. at the Atlantic City convention.

"We now find that this outlaw organization is permitting its members to act as strikebreakers at numerous pits in Ohio. This organization is furnishing steam shovel engineers to work under armed guards under no agreement which exists by and between this organization and the mining department or any branch of the A. F. of L. permitting them to work under such circumstances.

"We have through representatives officially taken this question up with the officers of the steam shovel men's union and have failed to secure any satisfaction.

"Representatives of our organization are justified in treating this crowd as an outlaw organization and in viewing its members in the same light as they do any other common strikebreaker.

JOHN L. LEWIS."

A copy of this telegram was posted and read in various places. Following the publication of the telegram from President Lewis preparations for an attack upon the mine were made. The hardware stores in all the cities of Williamson county were searched for firearms. The weapons were either taken by force or upon a verbal assurance that the local would pay for them.

The men working at the strip mine were evidently ignorant of being strikebreakers. The men operating the steam shovels were affiliated with a union, even though unrecognized by the A. F of L.

The guards were told they were to protect the valuable machinery and did not awake to the real danger until noon time of June 21, when bullets began to fly into the mine in such volume as to compel them to take refuge in the office, and later to seek safety under the steel railroad cars on the strip mine property.

Superintendent McDowell telephoned a number of times to Colonel Hunter for protection and was invariably informed by the latter that the sheriff could not be found. Finally Colonel Hunter suggested a flag of truce, which, while displayed by the mine defenders, caused no abatement of the fire.

In the evening of June 21, upon the return to Marion of Sheriff Thaxton, a conference was held between the sheriff, Colonel Hunter, and officers of the miners' union, at which it was stated that the officials of the coal company were willing to discontinue the operation of the strip mine and the union officials were willing that the workmen employed therein should be permitted to depart in safety. The substance of this agreement was transmitted over the telephone to Superintendent McDowell at the strip mine.

Nevertheless, at the break of day the following morning firing began in a heavy volume from close proximity. The attacking party having crept up under cover of darkness, they were sufficiently close to permit of a parley and after a time a spokesman for the strip mine workers asked to speak to the leader.

A long range conversation was held and it was agreed by a spokesman from the attacking party that safe conduct would be accorded the men if they laid down their arms and would march out with hands up.

This was done and from behind the earth embankments created by the steam shovel operators came a great number of armed men and more from the surrounding hills until the forty-seven surrendering men were surrounded by many hundreds of men, mostly armed.

The captive men were marched down the road toward Herrin in double file. After they had marched about one mile, Superintendent McDowell, being crippled and unable to keep up with the procession, was taken aside by members of the mob and shot to death.

The remainder of the captives were marched on the public road

SPECIAL GRAND JURY THAT INDICTED 214 FOR HERRIN MASSACRE

and were stopped at the power house of the Interurban railroad, about three miles from Herrin. Here a change in leadership took place and the man who had guaranteed the safety of the men who had surrendered was deposed and another leader installed.

The new commander ordered the captive men to march into the woods adjacent to and around the power house. Here the new leader directed that only those in the crowd who had guns should follow into the woods and those who were unarmed should remain without.

The surrendered men were then marched some 200 yards back of the power house, to the vicinity of a barbed wire fence, where they were told they would be given a chance to run for their lives, under fire.

The firing began immediately, and thirteen of the forty-seven non-union men were killed and most of the others severely wounded.

The mob pursued those who had escaped, and two were hung to trees, six were tied together with a rope about their necks, and marched through the streets of Herrin to an adjacent farm, where they were shot by the mob and the throats of three were cut. One of the six survived.

The atrocities and cruelties of the murderers are beyond the power of words to describe. A mob is always cowardly, but the savagery of this mob in its relentless brutality is almost unbelievable. The indignities heaped upon the dead did not end until their bodies were interred in unknown graves.

On the first day of the attack on the mine two union miners were killed by the answering fire from the men in the strip mine, and another so seriously injured as to die subsequently from his wounds.

It has been difficult for this grand jury to determine who fired the shots from the strip mine which caused the deaths of the union miners. When asked to present evidence to the grand jury which would tend to fix responsibility, counsel for the miners' union announced that they would lend no aid to the grand jury.

The grand jury has made no attempt to determine the equities between the operators and the miners in the strike controversy. It has had but the sole thought of bringing to the bar of justice the persons who committed the crimes which have brought such universal criticism upon the people of Williamson County, Illinois.

Without discrimination, we feel keenly the horror of the tragedy. We protest, however, against the intimation that all the people of Williamson County are lawless and un-American. The development of the mining industry in Williamson County and the surrounding counties has tremendously increased the population within the last decade.

All of the adjoining counties contributed their quota of marauders, and the entire shame of the inhuman murders should not rest upon Williamson County alone.

It is true the electorate of the county is responsible for those of its supine, weak and cowardly officials who permitted the disorders to grow from desultory rioting into a hideous massacre. Those evils can be corrected by the great majority of the population who believe in law and order asserting themselves and longer refusing to be intimidated by a disorderly minority.

The adjutant general's office and the sheriff's office alternated in passing responsibility, with neither taking decisive action to prevent disorders and protect property.

The ease with which firearms were obtained causes the grand jury to believe that legislation should be enacted to regulate or prohibit the manufacture or indiscriminate sale of firearms.

We condemn the laxity of the local police in the various cities wherein stores were looted for firearms without interference by them.

We commend the state's attorney of Williamson County, Delos Duty, for his courage and fidelity to his oath of office, and we express our gratitude to the Attorney General of Illinois and his efficient assistants whose aid has greatly facilitated the tremendous tasks confronting the grand jury.

In concluding this report the grand jury begs leave to state that it has indicted some forty persons for murder, fifty-eight for conspiracy to commit murder, fifty-eight for rioting, and five for assault to murder, and your jury asks leave for a recess of thirty days for the purpose of completing its labors. The grand jury is deeply grateful to the many representative, law-abiding citizens of Williamson County, for their assistance and encouragement in its efforts to enforce the law fearlessly and impartially.

Electrical Engineers at Huntington, W. Va., Present Reports on Mine Practice

Huntington held a well-attended and interesting exposition in the Chamber of Commerce Building from Sept. 18 to 23, at which a large number of electrical supply companies made exhibits. Several of these were quite elaborate. Concurrently from Sept. 19 to Sept. 22 the West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers met in the City Hall of Huntington. Only morning sessions were held by the association, the afternoons being devoted to the exposition, which were not less educative than the meetings themselves.

On Monday a report was made on power costs and on mine locomotives and tires, the first report being presented by C. E. Rogers in place of M. A. Maxwell, who was absent. On Wednesday reports were made on underground distribution of energy and on the relative merits of straight storage-battery, combination and conductor-cable-reel gathering locomotives. These reports were preceded by an address by C. E. H. Von Sothen on automatic hoisting and substation operation, this being the paper assigned to M. A. Whiting, also of the General Electric Co. In the afternoon a visit was made to the plant of the West Virginia Rail Co., where a number of interesting tests on the breakage of rails were conducted.

On Thursday reports were made on "all-rubber insulator cables as compared with ordinary braid-covered cables for portable extensions, locomotive cable, mining-machine cables, etc." and on "the use on mine locomotives of resistance grids made of rolled steel plate as compared with cast grids." The article on "the manner in which mechanical and electrical men can increase their usefulness" was read by R. D. Hall; W. C. Shunk, the author, being absent.

On Friday M. W. Crenshaw read a paper on the wireless telephone with illustrations and display of apparatus. The committee on the proper handling and care of insulating oils reported, and the following were elected to office for the ensuing year:

Roscoe Woltz, electrical engineer, Stonega Coal & Coke Co., Big Stone Gap, Va., president; R. R. Webster, Elkhorn Piney Coal Mining Co., Weeksbury, Ky., vice president; Herbert Smith, Elkhorn Piney Coal Mining Co., secretary and treasurer. The executive committee consists of J. H. Edwards, the retiring president; F. M. Reigher, George Suiter, J. J. Fluck and H. Maxwell.

John G. Smyth Killed by Fall of Slate

John G. Smyth, general manager of the Consolidation Coal Co., Jenkins, Ky., was instantly killed Sept. 21 by a fall of slate. The accident did not happen in a Consolidation mine but in a small operation on Shelby Creek, in which Mr. Smyth was part owner.

Mr. Smyth was 43 years of age, a son of the late William P. Smyth, Wilkes-Barre, Pa., who at one time was general superintendent of the Lehigh & Wilkes-Barre Coal Co. and the Parrish Coal Co. After leaving school he became connected with the Lehigh & Wilkes-Barre Coal Co., as well as the Parrish Coal Co., but later he left for the Virginia coal fields. Later he became affiliated with the Consolidation Coal Co. and was made general manager of the Kentucky fields, his residence being in Jenkins, Ky.

Production of Anthracite Rapidly Nears Normal Basis; New Price Circulars Include Pennsylvania Tax

Production of anthracite has been brought up to normal more quickly than had been expected. From 1,064,000 net tons the first week after the strike the output rose to between 1,800,000 and 1,900,000 tons in the week of Sept. 23. This remarkable and unexpected acceleration in production brings the output to a figure comparable with that following the "miners' vacation" in the autumn of 1920.

Fully two weeks elapsed after anthracite mining was resumed before all the old-line producing companies announced their new price circulars. Tonnage held at terminals pending price determination has now been released by the publishing of temporary prices which range $7.75@$8.35 on the large sizes. The increases of from 15c. to 30c. as compared with the last pre-strike quotations presumably are made to cover the Pennsylvania state production tax. Quotations on steam sizes have been increased in line with soft-coal prices. Following are the ruling quotations per gross ton f.o.b. mine as quoted on the New York market:

Lehigh Valley—Broken, $7.90; egg, $8.10; stove, $8.15; chestnut, $8.15; pea, $6.15; buckwheat, $4; rice, $3; barley, $2.

Williams & Peters (Erie)—Broken, $7.75; egg, $7.75; stove, $8; chestnut, $8; pea, $6.15; buckwheat, $4; rice, $3; barley, $2.

Lackawanna—Broken, $7.75; egg $8; stove, $8; chestnut, $8; pea, $6.15.

Lehigh & Wilkes-Barre Coal Co.—Broken, $7.75; egg, $8; stove, $8; chestnut $8; pea, $6.15; buckwheat $4; rice, $3; barley, $2; boiler, $2.50.

Lehigh Coal & Navigation Co.—Broken, $8.10; egg, $8.35; stove, $8.35; chestnut, $8.35; pea, $6.20; buckwheat, $4; rice, $2.75.

Hudson—Broken, $8.15; egg, $8.15; stove, $8.15; range (new size) $8.15; buckwheat, $4; birdseye, $2.75.

Philadelphia & Reading—Broken, $7.90; egg, $8.10; stove, $8.20; chestnut, $8.20; pea, $6.20; buckwheat, $4; rice, $2.75; barley, $2.

Independent Producers Say Maximum Is Too Low

Despite the statement by the Pennsylvania Fair Practice Committee that $8.50 was considered the maximum price that independent operators could charge for their coal, quotations are now within a range of $9@$9.50. Immediately after mining was resumed some of this coal moved as high as $14 f.o.b. mines and high quotations are still rumored. Some independent producers say that they must receive a price in excess of that given by the committee and as an alternative may ship their product outside the state and beyond the jurisdiction of that body. The Pennsylvania state authorities, realizing that it is necessary to have the maximum production of anthracite to meet the needs of the country, have announced that any mines which cannot be operated at the $8.50 maximum shall be given a hearing and that after an analysis of their production figures by the Fair Practice Committee, a higher price may be granted to cover higher costs. These prices will be announced from time to time as examinations are made and the price determined by the Fair Practice Committee in the State of Pennsylvania.

William H. Woodin, State Fuel Administrator for New York, announced on Sept. 22 that the immediate supply of anthracite domestic coal for the several states would be between 50 and 60 per cent of normal. This necessitates, Mr. Woodin said, the strictest form of economy in the use of domestic sizes of anthracite and the full use of substitutes.

Some hard coal is beginning to trickle into the Northwest. Shipments are very small, however, and no Lake charters have been signed as yet. Consumers in this territory are being urged to use lignite and coke as well as bituminous coal substitutes as far as possible.

Burns Brothers, in New York City, are advertising British coal as a substitute for anthracite for certain limited uses, at prices about the same as for anthracite. In New Jersey the Governor has issued a proclamation setting the price of coal for householders at 15c. above last year's quotations. He did this through the New Jersey State Fuel Commission, after having refused to call a special session of the Legislature to pass on coal questions.

The Pennsylvania Fuel Commission on Sept. 7, 1922, adopted the following regulations fixing the maximum gross margin for retailers and setting rules for distribution and standard of preparation for anthracite:

(1) The maximum gross margin per ton on sales of anthracite by retailers shall not exceed the gross margin per ton realized during the month of March, 1922, without the authorization of the commission.

(2) Retailers shall limit delivery of anthracite to domestic consumers to 60 days' supply.

(3) To avoid hoarding and to insure equitable and supervised distribution, anthracite operators are prohibited from shipping domestic sizes for household use to any consignee other than an established retail coal merchant, unless authorized by the Pennsylvania Fuel Commission.

(4) All anthracite offered for sale or shipment shall be maintained at the standard of preparation existing in March, 1922.

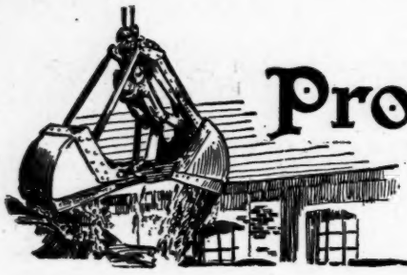
Ford Plants Reopen; Idle Four Days

Plants of the Ford Motor Co. which were closed Sept. 16, throwing 70,000 to 80,000 people out of employment in Detroit, when the company was unable to obtain adequate coal supply, began reopening at midnight Sept. 21. Orders for the resumption of operations came within twenty-four hours after announcement of the action of the Interstate Commerce Commission in modifying Service Order No. 23 and substituting order No. 25, permitting distribution of coal to industrial concerns even though not included in the essential classification of priority group No. 1.

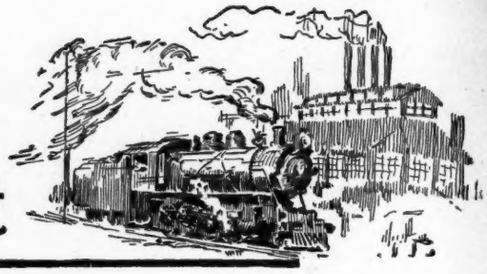
Under the operation of the order as it stood before the change the Ford company, though owning and operating mines in the Banner Fork district of Kentucky and owning and operating a railroad on which the coal was brought to Detroit, was denied the use of the coal and would be required to turn it over to railroads or public utilities. Modification of order No. 23 will enable the company to use coal produced by its own mines and moved on its own railroad.

Henry Ford made the prophecy last week that coal will soon be much cheaper. He advised the people of the whole country not to buy much now but to wait for the slump. He said in an interview that there is enough coal above ground now to last the country for some time and that even anthracite is going to reach the Middle West, though the motor king is in some doubt about any drop in the price of that coal. The exalted price levels on soft coal were attained, he said, because producers tried to hold coal back from the market, but the prices are tumbling now. He said his company had recently bought 500 cars in Toledo at $5 a ton including freight and arranged for a 60-day supply through Cincinnati from agencies at $3 at the mines. "Before spring coal will sell a good deal below $3 at the mines," he prophesied.

An attack upon coal prices is being made in the Chicago City Council, where an alderman who is a candidate for office has charged that an operators' ring and a retailers' ring are holding up the market with heavy penalties for those who undersell fixed price levels. The council's committee on the high cost of living is expected to make an investigation. The Chicago Retail Coal Merchants' Association denies all the charges and has filed suit against the alderman for $200,000.



Production and the Market



Weekly Review

DECLINING prices have been checked, temporarily at least, by the strong demand for domestic fuel. While the household consumer is not buying heavily, retailers in some areas, especially the Middle West, are filling their yards with bituminous coal for winter distribution. Dealers are beginning to realize that anthracite will not be obtainable in sufficient quantity before Jan. 1. Steam grades are in no better position than at the beginning of September and in some markets distress lots can be obtained at bargain prices.

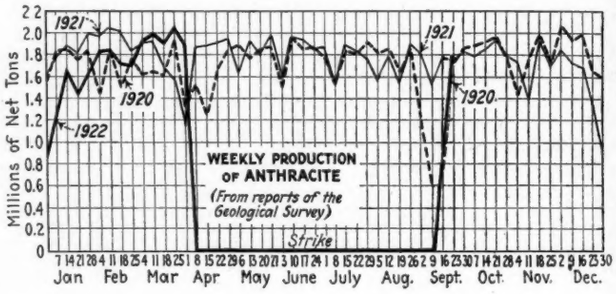
The aggregate result of the stronger domestic demand and poor industrial call is reflected in *Coal Age* Index of spot bituminous prices, which registers a rise of 6 points to 418 as of Sept. 25, from 412 the week before. This week's figure represents an average mine price of $5.06, as compared with $4.99 for the preceding week.

Transportation Conditions Badly Upset

Transportation conditions are deplorable, especially in the West. Coal is moving very slowly, gateways are congested and mines are everywhere short of cars. In some parts of Kentucky production has been limited to one day per week by the carriers' inability to furnish empties and haul loads. Lines furnishing the Hampton Roads piers are giving poor service. Resumption of anthracite mining has greatly reduced the car supply in the adjacent soft-coal fields. Surplus cars have been exhausted in the past two weeks for the first time since early in 1921, and until the railroads can increase the turn-around there will be no better car supply.

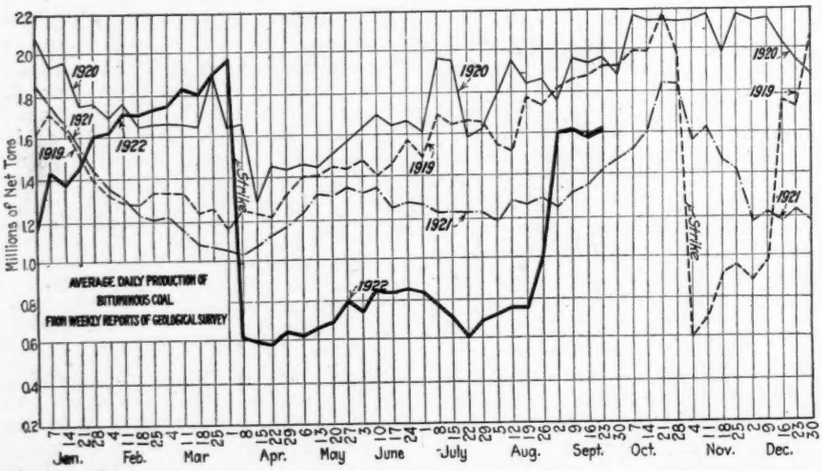
Despite these factors limiting the supply the buyer of industrial coal maintains his attitude of aloofness, to which the passage of the federal coal bills has added point. He believes that prices will not be allowed to ascend. State authorities are modeling similar measures—Ohio has already passed such a bill—and the buyer sees in these an argument for awaiting lower prices. Coal men are divided in their opinion on the future of the steam-coal market this winter. Some are of the very definite opinion that there is so little inherent strength in the industrial demand that prices cannot rise—in other words, the railroads will be able to haul as much coal as is urgently required. Others equally well informed and as thoroughly experienced in the trade look forward to a very definite shortage, a strong demand and high prices.

The Lake trade is very active. Dumpings passed the 1,000,000-ton mark last week and are still increasing. Record-breaking receipts and excellent rates of discharge are reported from the Head-of-the-Lakes, where an



easier feeling now prevails. This heavy flow of coal has blunted the edge of climbing dock prices and the lowered quotations have brought in many delayed orders. Coal is flowing off the docks as fast as it is unloaded, and boats are making one-day turn-arounds in a feverish attempt to transport as heavy a tonnage as possible during the remainder of the season.

With the announcement of new circular prices by the old-line producing companies much anthracite that had


Millions of Net Tons
1920
1921
1919
1922
Strike
AVERAGE DAILY PRODUCTION OF BITUMINOUS COAL FROM WEEKLY REPORTS OF GEOLOGICAL SURVEY
Jan. Feb. Mar Apr. May June July Aug. Sept. Oct. Nov. Dec.

Estimates of Production

(Net tons)

BITUMINOUS

Week ended:	1921	1922
Sept. 2 (*b*)	7,606,000	9,359,000
Sept. 9 (*b*)	7,083,000	8,791,000
Sept. 16 (*a*)	8,187,000	9,661,000
Daily average	1,365,000	1,610,000
Calendar year	278,023,000	251,371,000
Daily av. cal. yr.	1,276,000	1,149,000

ANHTRACITE

Sept. 2 (*b*)	1,770,000	36,000
Sept. 9 (*b*)	1,483,000	50,000
Sept. 16 (*a*)	1,749,000	1,064,000
Calendar year (*b*)	66,034,000	23,325,000

COKE

Sept. 9 (*b*)	60,000	138,000
Sept. 16 (*a*)	64,000	139,000
Calendar year	3,964,000	4,505,000

(*a*) Subject to revision. (*b*) Revised from last report.

been held at destination has been released for retail distribution. The new domestic coal prices are 15c.@ 30c. higher than the latest pre-strike quotations, presumably to cover the Pennsylvania state tax. Distribution is being carefully watched by state authorities, that the meager supplies may serve current needs only. The movement so far has been eastward, very little tonnage going west of the mines. No Lake charters have been made, although some coal is dribbling into the Northwest.

Independent coal is moving generally at a high of $9.50 compared with the maximum of $8.50 announced by the Pennsylvania Fair Practice Committee. Unless a modification of the committee ruling is made it is likely that most of the independent tonnage will be shipped out of Pennsylvania to enable producers to obtain what they insist is an adequate return for their commodity.

BITUMINOUS

"Production of bituminous coal in the last week (Sept. 18-23) is estimated at from 9,600,000 to 9,900,000 tons," says the Geological Survey, "a slight increase over the preceding week. Loadings on Monday, Sept. 18, were 37,330 cars, the highest since the close of the strike. On Tuesday, however, they dropped sharply to 29,496 cars.

"The present output is above that of the corresponding period of the year of depression, 1921, but is below that of the preceding four years. The present condition of the coal market resembles the three years 1918 to 1920 more than 1921. In those three years, as now, demand for soft coal was active enough to absorb all the coal that could be transported."

Movement of all-rail coal to New England increased to 3,009 cars during the week ended Sept. 16 from 2,722 cars in the preceding week. That market, however, is well stocked and prices are easy, movement being largely on contract. Cheaper coal by water tends to restrict the all-rail spot shipments. These water coals are being kept from lower price levels by the more active Western demand for low-volatiles.

SUMMARY OF NEW ENGLAND RECEIPTS, JANUARY TO AUGUST, INCLUSIVE, 1916-1922 *a*

(In Net Tons)

	Anthracite			Bituminous		
	Tide	Rail	Total	Tide	Rail	Total
1916	3,462,000	3,616,000	7,078,000	9,831,000	6,654,000	16,485,000
1917	3,016,000	4,715,000	7,731,000	9,130,000	7,671,000	16,801,000
1918	2,896,000	6,716,000	9,612,000	10,902,000	7,997,000	18,899,000
1919	2,130,000	4,411,000	6,541,000	5,588,000	6,225,000	11,813,000
1920	2,298,000	4,853,000	7,151,000	6,628,000	7,629,000	14,257,000
1921	2,600,000	5,443,000	8,043,000	5,218,000	5,802,000	11,020,000
1922	1,025,000	2,320,000	3,345,000	7,733,000	3,072,000	10,805,000

a Data furnished by courtesy of the Massachusetts Fuel Administrator.

Hampton Roads dumpings for all accounts were 297,600 net tons during the week ended Sept. 21, as compared with 341,558 tons in the previous week. Some exporting has been

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

Low-Volatile, Eastern	Market Quoted	Aug. 28, 1922	Sept. 11, 1922	Sept. 18, 1922	Sept. 25, 1922†
Smokeless lump	Columbus	$6.25	$6.40	$6.25	**$6.00@$7.25**
Smokeless mine run	Columbus	5.75	5.75	5.75	**5.75@ 6.25**
Smokeless screenings	Columbus	5.60	5.65	5.50	**5.50@ 6.00**
Smokeless lump	Chicago	6.00	6.10	6.25	**5.50@ 7.50**
Smokeless mine run	Chicago	5.75	6.00	5.85	5.00@ 6.75
Smokeless lump	Cincinnati	5.75	7.00	6.50	*5.15@ 7.50*
Smokeless mine run	Cincinnati	5.25	5.50	5.50	**4.90@ 6.50**
Smokeless screenings	Cincinnati	5.15	5.50	5.50	*4.60@ 6.00*
*Smokeless mine run	Boston	9.00	8.35	8.05	7.90@ 8.25
Clearfield mine run	Boston	5.85	5.00	4.35	**4.00@ 5.00**
Cambria mine run	Boston	6.25	5.50	5.25	*4.50@ 5.50*
Somerset mine run	Boston	6.00	5.10	4.85	*4.25@ 5.25*
Pool 1 (Navy Standard)	New York	....	....	5.40	**5.50@ 6.00**
Pool 1 (Navy Standard)	Baltimore	....	....	5.50	**5.75@ 6.00**
Pool 9 (Super.Low Vol.)	New York	6.35	5.25	4.75	**4.75@ 5.25**
Pool 9 (Super.Low Vol.)	Philadelphia	7.25	5.60	5.60	*5.00@ 5.75*
Pool 9 (Super.Low Vol.)	Baltimore	6.25	6.10	5.10	**5.25@ 5.75**
Pool 10 (H.Gr.Low Vol)	New York	5.85	4.80	4.35	**4.50@ 4.75**
Pool 10 (H.Gr.Low Vol.)	Philadelphia	7.00	5.30	5.10	5.00@ 5.25
Pool 10 (H.Gr.Low Vol.)	Baltimore	5.85	5.75	4.85	4.75@ 5.00
Pool 11 (Low Vol.)	New York	5.35	4.35	4.10	4.00@ 4.25
Pool 11 (Low Vol.)	Philadelphia	6.50	4.85	4.85	*4.70@ 4.75*
Pool 11 (Low Vol.)	Baltimore	5.50	4.85	4.35	4.25@ 4.50
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	....	5.15	4.35	**4.35@ 5.00**
Pool 54-64 (Gas and St.)	Philadelphia	6.00	4.60	4.60	4.50@ 4.75
Pool 54-64 (Gas and St.)	Baltimore	5.60	4.60	4.60	**4.50@ 5.00**
Pittsburgh mine run (St.)	Pittsburgh	....	4.65	4.65	*4.00@ 5.00*
Kanawha lump	Columbus	6.00	6.40	5.75	**6.00@ 6.75**
Kanawha mine run	Columbus	5.60	6.00	5.50	**5.50@ 6.00**
Kanawha screenings	Columbus	5.50	5.75	5.30	**5.50@ 5.75**
W. Va. Splint lump	Cincinnati	5.35	7.00	6.85	*6.00@ 7.00*
W. Va. Gas lump	Cincinnati	5.35	7.00	6.85	*6.00@ 7.00*
W. Va. mine run	Cincinnati	5.00	5.65	5.35	5.00@ 5.75
W. Va. screenings	Cincinnati	4.85	5.40	5.25	*5.00@ 5.25*
Hocking lump	Columbus	6.00	6.25	5.75	**6.00@ 6.50**
Hocking mine run	Columbus	5.85	5.65	5.10	*4.50@ 5.00*
Hocking screenings	Columbus	5.60	5.40	5.25	*4.00@ 4.50*
Pitts. No. 8 lump	Cleveland	5.75	5.75	4.85	**4.75@ 5.25**
Pitts. No. 8 mine run	Cleveland	5.25	5.10	4.60	4.50@ 4.75
Pitts. No. 8 screenings	Cleveland	$5.25	$5.10	$4.60	*$4.25@$4.50*
Midwest					
Franklin, Ill. lump	Chicago	5.05	5.40	5.40	5.25@ 5.50
Franklin, Ill. mine run	Chicago	4.65	4.75	4.75	4.50@ 5.00
Franklin, Ill. screenings	Chicago	4.25	4.90	4.45	*4.00@ 4.25*
Central, Ill. lump	Chicago	5.10	4.95	5.10	4.90@ 5.25
Central, Ill. mine run	Chicago	4.65	4.50	4.55	4.35@ 4.75
Central, Ill. screenings	Chicago	4.45	4.30	3.60	*3.25@ 3.50*
Ind. 4th Vein lump	Chicago	5.25	5.25	5.25	5.00@ 5.50
Ind. 4th Vein mine run	Chicago	4.85	4.85	4.85	4.65@ 5.00
Ind. 4th Vein screenings	Chicago	4.75	4.60	4.60	*3.75@ 4.00*
Ind. 5th Vein lump	Chicago	5.10	5.10	5.10	4.90@ 5.25
Ind. 5th Vein mine run	Chicago	4.65	4.65	4.65	4.50@ 4.75
Ind. 5th Vein screenings	Chicago	4.40	4.40	4.40	*3.75@ 4.00*
Standard lump	St. Louis	3.90	4.65	4.75	**4.25@ 5.50**
Standard mine run	St. Louis	3.40	2.85	3.90	3.75@ 4.00
Standard screenings	St. Louis	2.90	3.35	2.85	*2.25@ 2.75*
West Ky. lump	Louisville	5.00	4.75	4.75	**4.75@ 5.00**
West Ky. mine run	Louisville	5.00	4.25	4.25	4.00@ 4.50
West Ky. screenings	Louisville	5.00	4.00	4.00	3.75@ 4.25
West Ky. lump	Chicago	4.25	4.25	4.25	3.50@ 5.00
West Ky. mine run	Chicago	4.25	4.25	4.25	3.50@ 5.00
South and Southwest					
Big Seam lump	Birmingham	4.75	3.95	3.45	**3.45@ 4.00**
Big Seam mine run	Birmingham	4.50	3.30	2.60	**2.60@ 3.00**
Big Seam (washed)	Birmingham	4.50	3.80	3.10	**3.10@ 3.75**
S. E. Ky. lump	Chicago	4.75	4.25	4.25	**4.50@ 7.50**
S. E. Ky. mine run	Chicago	4.75	4.25	4.25	**4.50@ 5.00**
S. E. Ky. lump	Louisville	5.25	6.25	6.65	**5.75@ 8.00**
S. E. Ky. mine run	Louisville	5.10	5.65	5.65	5.00@ 6.25
S. E. Ky. screenings	Louisville	4.75	5.25	5.50	5.00@ 6.00
S. E. Ky. lump	Cincinnati	5.35	7.00	6.85	6.50@ 7.25
S. E. Ky. mine run	Cincinnati	5.25	5.50	5.35	**5.00@ 6.00**
S. E. Ky. screenings	Cincinnati	4.85	5.40	5.25	*5.00@ 5.25*
Kansas lump	Kansas City	6.00	6.00	6.25	6.00@ 6.50
Kansas mine run	Kansas City	5.00	5.00	5.00	5.00
Kansas screenings	Kansas City	2.85	2.75	2.60	2.00@ 3.25

*Gross tons, f.o.b. vessel, Hampton Roads.
†Advances over previous week shown in **heavy type**, declines in *italics*.
NOTE—Smokeless prices now include New River and Pocahontas.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

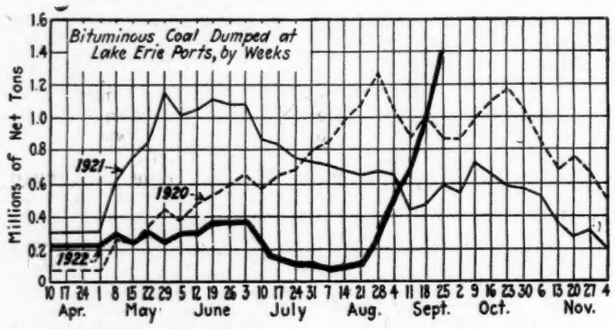
INCLUDES PENNSYLVANIA STATE TAX

	Market Quoted	Freight Rates	Latest Independent	Pre-Strike Company	Sept. 25, 1922† Independent	Sept. 25, 1922† Company
Broken	New York	$2.34	.....	$7.60@$7.75	$9.00	**$7.75@$8.15**
Broken	Philadelphia	2.39	$7.00@$7.50	7.75@ 7.85	.....	**7.90@ 8.10**
Egg	New York	2.34	7.60@ 7.75	7.60@ 7.75	**9.25@9.50**	**7.75@ 8.35**
Egg	Philadelphia	2.39	7.25@ 7.75	7.75	**9.25@9.50**	**8.10@ 8.35**
Stove	New York	2.34	7.90@ 8.20	7.90@ 8.10	**9.25@9.50**	**8.00@ 8.35**
Stove	Philadelphia	2.39	7.85@ 8.15	8.05@ 8.25	**9.25@9.50**	**8.15@ 8.35**
Chestnut	New York	2.34	7.90@ 8.20	7.90@ 8.10	**9.25@9.50**	**8.00@ 8.35**
Chestnut	Philadelphia	2.39	7.85@ 8.15	8.05@ 8.25	**9.25@9.50**	**8.15@ 8.35**
Range	New York	2.34	.....	.....	.....	8.15
Pea	New York	2.22	5.00@ 5.75	5.75@ 6.45	**6.55@7.00**	**6.15@ 6.20**
Pea	Philadelphia	2.14	5.50@ 6.00	6.15@ 6.25	**6.75@7.00**	*6.15@ 6.20*
Buckwheat No. 1	New York	2.22	2.75@ 3.50	3.50	**4.00@6.50**	**4.00@ 4.25**
Buckwheat No. 1	Philadelphia	2.14	2.75@ 3.25	3.50	**4.00@5.50**	**4.00**
Rice	New York	2.22	2.00@ 2.50	2.50	**2.75@4.00**	**2.75@ 3.00**
Rice	Philadelphia	2.14	2.00@ 2.50	2.50	.....	**2.75@ 3.00**
Barley	New York	2.22	1.50@ 1.85	1.50	**2.00@3.00**	**2.00**
Barley	Philadelphia	2.14	1.50@ 1.75	1.50	.....	**2.00**
Birdseye	New York	2.22	.....	.00@ 2.50	.....	**2.75**

resumed and pier supplies again exceed vessel tonnage awaiting cargo. Sales in New England are being made with increasing difficulty, as stocks preclude much future buying.

Unloading piers at New England ports are congested with British coal. At certain of the railroads there is a delay of more than three weeks, while private stocks are also badly tied up.

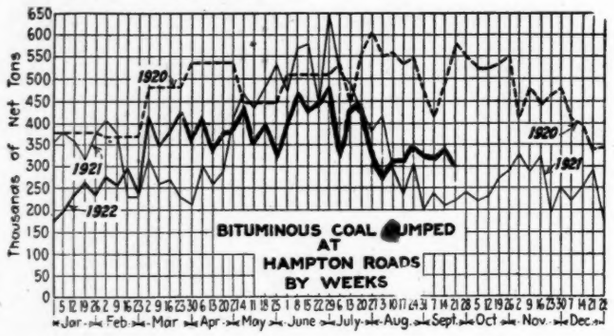
Lake coal is now going forward at a rate exceeding the maximum of any time in the past. Dumpings were 1,400,000 net tons during the week ended Sept. 25, as compared with 1,058,806 tons in the week preceding. Approximately 8,800,000 tons have been sent forward to date this season, as compared with 17,670,000 tons in the corresponding period of 1921 and 13,950,000 tons in 1920. The hope of the Ore & Coal Exchange that 15,000,000 tons will be moved this season may fail to be realized if the threatened seamen's strike materializes on Oct. 1. Labor trouble on the Lake Erie docks may also slow the Lake movement.



ANTHRACITE

Production of hard coal during the first week after the strike was 1,064,000 net tons. Preliminary estimates for last week place the output at between 1,800,000 and 1,900,000 tons, or close to normal.

Steam sizes are in active competition with soft coal. Canadian buyers invaded Buffalo last week, only to find that no coal would be available to them for some time. Family sizes are moving eastward and it will be Jan. 1 before the Midwest gets much hard coal. The Lakes are getting little tonnage as yet. Independent quotations are within a range of $9@$9.50, although some wild quotations have been rumored since the resumption of mining.

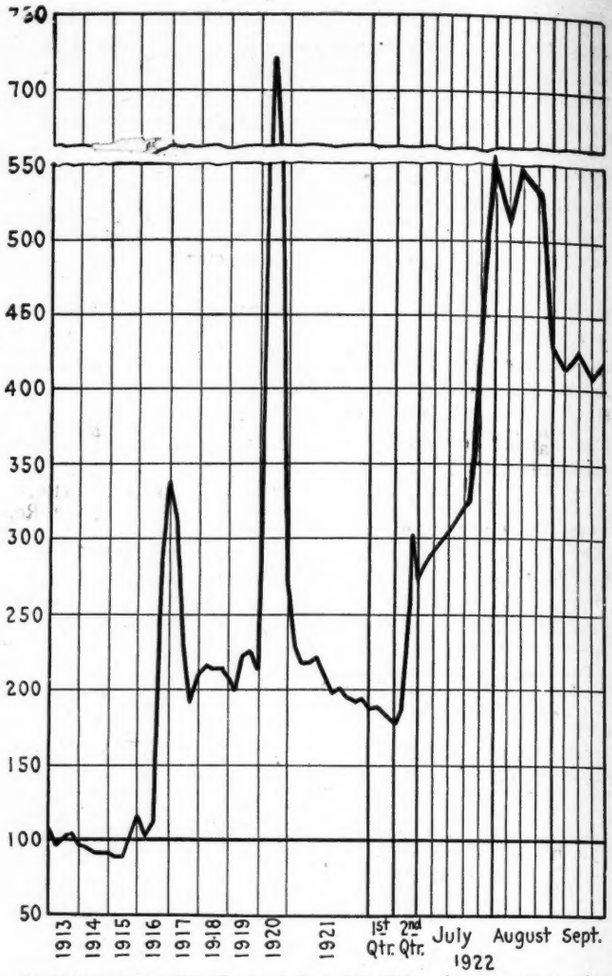


COKE

Beehive coke production has remained at a rate of about 140,000 net tons—139,000 tons during the week ended Sept. 16—for the last three weeks. Lack of cars is now limiting the output and the strike has been a waning factor since early in September. It is doubtful if additional furnaces could resume now, as the coke offerings are very limited and a strong retail demand for coke has sprung up.

Car Loadings and Surplusages

Cars loaded:	All Cars	Coal Cars
Week ended Sept. 9, 1922	832,744	139,570
Previous week	931,598	149,487
Same week a year ago	749,552	142,148
Preliminary report, week ended Sept. 16, 1922	.....	195,142
Surplus cars:		
Sept. 8, 1922	43,168	34,685
Aug. 31, 1922	70,455	54,566
Same date a year ago	237,972	120,831



Coal Age Index 418, Week of Sept. 25, 1922. Average spot price for same period $5.06. This diagram shows the relative, not the actual prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the U. S., weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. (Pittsburgh District prices not included in figures for last week.)

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Six Months July to Dec. 1921	Jan. 1 to Apr. 1, 1922 Inclusive	Week Ended Sept. 9
U. S. Total	45.6	55.7	....
Alabama	63.5	64.6	88.0
Somerset County	55.5	74.9	41.6
Panhandle, W. Va.	55.3	51.3	68.6
Westmoreland	54.9	58.8	90.4
Virginia	54.8	59.9	48.6
Harlan	53.3	54.8	18.3
Hazard	51.7	58.4	14.4
Pocahontas	49.8	60.0	38.6
Tug River	48.1	63.7	28.5
Logan	47.6	61.1	24.2
Cumberland-Piedmont	46.6	50.6	34.9
Winding Gulf	45.7	64.3	38.1
Kenova-Thacker	38.2	54.3	48.5
N. E. Kentucky	32.9	47.7	27.0
New River	24.3	37.9	36.0
Oklahoma	63.9	59.6	58.2
Iowa	57.4	78.4	84.8
Ohio, Eastern	52.6	46.6	56.1
Missouri	50.7	66.8	65.0
Illinois	44.8	54.5	61.2
Kansas	42.0	54.9	78.3
Indiana	41.4	53.8	(a)
Pittsburgh†	41.2	39.8	(a)
Central Pennsylvania	39.1	50.2	80.1
Fairmont	35.3	44.0	53.8
Western Kentucky	32.5	37.7	38.9
Pittsburgh*	30.4	31.9	(a)
Kanawha	26.0	13.0	10.4
Ohio, southern	22.9	24.3	44.3

* Rail and river mines combined.
† Rail mines.
(a) No report.

Foreign Market And Export News

British Market Further Depressed; Better Trade Conditions Aid French

Compared with the activities of the last few weeks the north of England coal market is in a weak state. There is plenty of coal to be had, especially in the gas and coking varieties. Port congestion is still acute and operators are pressing their claims for three shifts for coal transport workers. Steam coals are lower in price and 20,000 tons have been sold for shipment during Jan.-March at 23s. Coasting business is more active but foreign buying is disappointing especially in the American, Italian, French and Scandinavian markets. Few contracts are worth reporting other than 50,000 tons of good Durham coking coal at 20s. 6d. for delivery f.o.b., during Sept.-Dec., and 5,000 tons of Durham gas coals for Bordeaux at 20s. 2d. c.i.f. for shipment in October. Inquiries from Germany continue to be strong.

The South Wales market is in a similar position. Since the rapid falling off of American demands prices have declined and operators have an abundance of coal to sell. On the other hand home demands for Welsh coal are slightly stronger. The Scottish trade is very quiet except for certain shipments to the Continent, especially Germany. Output during the week ended Sept. 9, declined slightly, according to a cable to *Coal Age*, falling from the previous week's record of 5,204,000 gross tons to 5,161,000 tons.

French Output Steadily Increases

Under the beneficial influence of the diversion created by sales of British coals to North America and influenced also by the present revival in the metallurgical and textile trades and by the approach of winter, the market may be considered quite satisfactory. Northern mines are taking from their stocks, and contracts are easily renewed.

Production is being gradually increased by the heavier output from devastated mines in course of reconstruction and, as the principal cause of the present improvement—the American coal strike—is essentially a transient one, it is easy to understand why French coal owners were so insistent at the recent Douai conference upon an extension of the miners' working time. A bill which, if enacted, would give satisfaction on that point to the coal owners, is now pending before the French Parliament.

Deliveries of German coke to France amounted to 312,000 tons in August, as against 418,000 tons fixed by the Commission of Reparations.

Coal Paragraphs from Foreign Lands

GERMANY—Production of coal in the Ruhr region during the week ended Sept. 10 was 1,761,000 metric tons, according to a cable to *Coal Age*. The preceding week's output was 1,729,000 tons.

ITALY—The price of Cardiff steam first is now quoted at 39s. 3d., according to a cable to *Coal Age*, as compared with last week's figure of 40s.

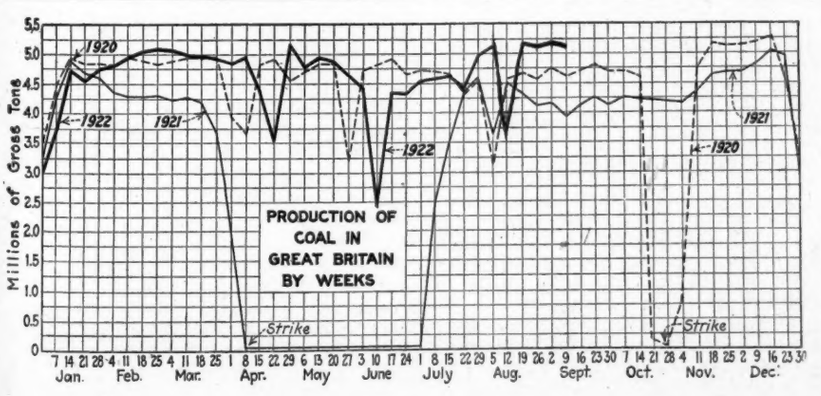
BELGIUM — A rising tendency is displayed by anthracite and some coals on the Belgian market in contrast to the weakness shown by industrial descriptions. Coke remains firm and active, while sales of briquets are good, even for export.

INDIA — The tone of the market is dull. Stocks are heavy. Mills and railways are not purchasing. Prices are: Bengal 1st, Rs. 30; Bengal good 2d, Rs. 27; English coal, Rs. 38; African coal, Rs. 27½.

PANAMA CANAL COAL PASSAGES were 404,389 gross tons during the fiscal year ended June 30, 1922. Of this tonnage the largest amount—236,749 tons—originated in the British Isles. The United States moved 156,122 tons. The West coast of South America took 153,639 tons of the total movement.

Canadian Imports Decline Sharply

Imports of anthracite by Canada during the first eight months of 1922 were 1,100,233 tons of domestic and 103,784 tons of steam sizes, as compared with average imports during the corresponding period for the last three years of 3,058,980 tons and 154,549 tons respectively. Imports of bituminous coal were 4,678,921 tons during 1922, while the three-year average imports for the same period were 8,368,264 tons.



Exports Clearances, Week Ended, Sept. 21, 1922

FROM HAMPTON ROADS:

	Tons
For Atlantic Islands:	
Nor. S.S. Fram, for Port au Spain	2,344
For Cuba:	
Br. S.S. Berwindvale, for Havana	7,743
Nor. S.S. Helgoy, for Havana	2,744

Roads Prices Continue to Soften

The situation was more encouraging last week. For the first time since the coal strike the stocks on hand at the piers exceeded the vessel tonnage awaiting cargo, and export coal was moving for the first time in six weeks.

Movement from the mines continued to improve. Prices were weaker although no marked drop occurred during the week. The bulk of the coal shipped was being moved coastwise.

Hampton Roads Pier Situation

	Week Ended Sept. 14	Week Ended Sept. 21
N. & W. Piers, Lamberts Point:		
Cars on hand	1,354	430
Tons on hand	73,663	72,806
Tons dumped	171,837	127,122
Tonnage waiting	71,050	63,650
Virginian Ry. Piers, Sewalls Point:		
Cars on hand	1,193	906
Tons on hand	69,400	52,600
Tons dumped	85,965	93,974
Tonnage waiting	54,150	48,509
C. & O. Piers, Newport News:		
Cars on hand	539	1,051
Tons on hand	28,000	52,500
Tons dumped	47,161	44,619
Tonnage waiting	...	5,490

Pier and Bunker Prices, Gross Tons

PIERS

	Sept. 16	Sept. 23†
Pool 10, Philadelphia	$8.50@$9.00	*$8.25@$8.75*
Pool 11, Philadelphia	8.00@ 8.75	*8.00@ 8.50*
Pool 10, New York	8.00@ 8.50	*8.00@ 8.25*
Pool 11, New York	7.75@ 8.00	7.75@ 8.00
Pool 1, Hamp. Roads	8.00@ 8.25	*7.90@ 8.15*
Pools 5-6-7 Hamp.Rds.	8.00@ 8.25	*7.90@ 8.15*
Pool 2, Hamp. Rds.	8.00@ 8.25	*7.90@ 8.15*

BUNKERS

	Sept. 16	Sept. 23†
Pool 10, Philadelphia	$8.75@$9.25	*$8.50@$9.00*
Pool 11, Philadelphia	8.25@ 9.00	8.25@ 9.00
Pool 10, New York	8.25@ 8.75	*8.30@ 8.55*
Pool 11, New York	8.00@ 8.25	*8.00@ 8.30*
Pool 1, Hamp. Rds.	8.00@ 8.25	8.00@ 8.25
Pool 2, Hamp. Rds.	8.00@ 8.25	8.00@ 8.25
Welsh, Gibraltar	40s. f.o.b.	40s. f.o.b.
Welsh, Rio de Janeiro	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Welsh, Lisbon	50s. f.o.b.	50s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	42s. t.i.b.	42s. t.i.b.
Welsh, Algiers	41s. 6d. f.o.b.	41s. 6d. f.o.b.
Welsh, Pernambuco	65s. f.o.b.	65s. f.o.b.
Welsh, Bahia	65s. f.o.b.	65s. f.o.b.
Welsh, Madeira	45s. 6d. f.a.s.	45s. 6d. f.a.s.
Welsh, Teneriffe	43s. 6d. f.a.s.	43s. 6d. f.a.s.
Welsh, Malta	42s. 6d. f.o.b.	42s. 6d. f.o.b
Welsh, Las Palmas	43s. 6d. f.a.s.	43s. 6d. f.a.s.
Welsh, Naples	42s. f.o.b.	42s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	52s. t.i.b.	52s. t.i.b.
Welsh, Constantinople	50s. f.o.b.	50s. f.o.b.
Welsh, St. Michaels	50s. t.i.b.	50s. t.i.b.
Welsh, Alexandria	43s. f.o.b.	43s. f.o.b.
Welsh, Port Said	51s. 6d. f.o.b.	51s. 6d. f.o.b.
Welsh, Oran	40s. f.o.b.	40s. f.o.b.
Welsh, Fayal	50s. t.i.b.	50s. t.i.b.
Welsh, Dakar	46s. 6d. f.o.b.	46s. 6d. f.o.b.
Welsh, St. Vincent	46s. f.a.s.	46s. f.a.s.
Welsh, Montevideo	50s. f.o.b.	50s. f.o.b.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	Sept. 16	Sept. 23†
Admiralty, large	27s. 6d.	*26s. 6d.*
Steam, smalls	18s.@19s.	*16s. 6d.*
Newcastle:		
Best steams	24s.@24s. 6d.	24s.@24s. 6d.
Best gas	23s. 9d.	23s. 9d.
Best bunkers	22s.6d@23s.	*22s. 6d.*

†Advances over previous week shown in **heavy type**; declines in *italics*.

North Atlantic

Slow Load Movement and Car Shortage Halt Price Drop

Large Buyers Most Active, Small Consumer Buying Mostly for Current Needs — Railroads Obtain Bargain Lots — Water-Borne Coal, Including British, Prevent Soaring of Others.

Last week's price decline has been checked by the increasing car shortage and the slower movement of loads. The congestion is more noticeable at Western points than in the North Atlantic section, but demand appears to have caught up with the supply. Large buyers are the most active, the smaller consumer still taking but little tonnage other than for current needs. Railroad buying is increasing and the carriers have recently been able to obtain some bargain coal.

Receipts by water are holding other coals from higher levels. British domestic coal is a factor, much of this fuel being sold off for industrial purposes. Hampton Roads is still sending tonnage coastwise at figures that are lower than a fortnight ago.

NEW YORK

There was a fairly good movement during the week, with demand quiet. The lack of rolling stock is becoming more noticeable and had a tendency to steady prices. The failure to increase production much above the 9,000,000-ton mark is cause for much thought by those consumers who hesitate to fill their bins.

For the week ended Sept. 22, thirteen vessels carrying 83,883 tons of British coal arrived here. An unusual amount of this tonnage was said to be free coal and was offered at around $7.50, alongside, in small boats.

There was a slight flurry in buying and inquiries the last couple of days of the week. Coal, however, moved slowly. About 1,700 cars were reported at the local docks.

Because of the easy quotations and the ability to get coal many consumers are continuing to use bituminous coal instead of the anthracite steam sizes.

PHILADELPHIA

The market is steadily absorbing the output with no particular urging. It would seem that the withdrawal of cars for the anthracite trade has affected operators even more than anticipated. One line which had been turning over several hundred empties a day, has now discontinued this movement, and in addition has added a restriction against loading its equipment off the home road.

One good feature of the trade is the almost entire elimination of priority orders by the I. C. C., the only one now effective being No. 1, covering in a general way emergency shipments of a lesser nature.

Despite the rather limited tonnage, lower prices are in the minds of most consumers and they continue to wait, at least to the point of placing only limited orders. The heavy consumer, who is also debating about price, is nevertheless taking good tonnages in an endeavor to get a normal winter stock. Railroads are in this class. As usual, however, the shipper is far from being able to make satisfactory prices on motive fuel. Prices have been around $3.50, but some has sold at $4.50.

At Tidewater some reports are current that British coal is inclined to congest, due to the number of recent arrivals, although this is not believed to be particularly true of this port.

BALTIMORE

Prices are again on the rise. At this time the run of cars on entire sections is below 40 per cent, and on some days important operations receive not a single empty. While there is not a thorough reflection of this situation as yet at consuming points, the condition has stiffened the backbone of quite a few operators to demand higher prices.

With a rising market the enthusiasm of Baltimore buyers to cover grows a bit less, as consumers here are in a somewhat better position than those at some other points by reason of the relief that came from the delivery of more than 100,000 tons of Hampton Road coals by barge, which went largely to local plants. Some of the English coal coming in for domestic use has also been sold to industrial plants when its broken condition in particular has brought about its sale below the price charged dealers who are supplying it for household use.

UPPER POTOMAC

Steady advances are being made in the Upper Potomac as conditions are restored to a normal basis. There are, however, a few mines along the Western Maryland still not in operation. With coal becoming more plentiful in Eastern market prices are softer.

FAIRMONT

Western shipments were put under the ban early in the week ended Sept. 16, owing to the fact that the B. & O. was unable to handle this business. During the greater part of the week the car supply was not ranging over 40 per cent of potential capacity. With so much coal forced eastward operators feared that those markets would soon become glutted.

CENTRAL PENNSYLVANIA

Prices vary but show a decline since the first week of the strike settlement. Pool 11 is $4@$4.15; Pool 10, $4.25@$4.50; Pools 9 and 71, $4.55@$4.75; Pool 1, $5@$5.50. High-volatile coal is $4@$4.25.

Railroads find themselves short of motive power to move all the coal. The Altoona shop of the Pennsylvania has a force amounting to 101 per cent of the force before the shopmen's strike was called. With this concentrated on engine repairs, much road equipment is being turned out daily.

Coke

UNIONTOWN

Only the tent colonies scattered about the Connellsville region show the existence of the miners' strike. At plants where cars are placed for loading there is sufficient labor to operate them.

The car situation is becoming acute but despite that development the coal market remains unchanged with the range of $4@$4.50 which has prevailed for the past two weeks. There are plenty of orders for available tonnage but consumers are not disposed to bid against each other.

As a general condition striking miners are holding fast and the majority remain with the "lost cause." Their confidence of ultimate victory despite the many broken promises of the organizers is one of the most remarkable things about the strike. Although union miners have now been working a month no effort has been made on the part of the union to supply that financial relief which was promised to striking Connellsville miners.

CONNELLSVILLE

The coke market has advanced, furnace coke being at $12 and foundry, $13.50@$14. Increasing output is limited by transportation conditions at most plants. There are thousands of men in the region still who consider themselves on strike but a complete wiping out of the strike would have little effect except to start some plants and curtail operations at others, there being a re-distribution of cars rather than an increase in the total supply available.

All told only three or four blast furnaces have been able to resume in the past 30 days on purchases of Connellsville coke, although a couple of steel interests have bought some tonnages, to mix with their byproduct coke. It seems very doubtful if in present circumstances any additional furnaces will be able to collect a supply as offerings are limited and a decidedly heavy demand has sprung up from miscellaneous consumers, in particular a widespread demand from retail dealers. Demand from foundries appears good, not so much because consumption is heavy as because foundries have little coming to them on contract and must buy from time to time.

The *Courier* reports production during the week ended Sept. 16 at 77,500 tons by the furnace ovens and 22,290 tons by the merchant ovens, a total of 99,790 tons, an increase of 2,460 tons.

BUFFALO

Byproduct ovens are getting more coal and are increasing their output. The local furnaces are running strong and are now getting more West Virginia coal by water since the car movement is a little better from that direction. Jobbers quote 72-hr. Connellsville foundry at $13, 48-hr. furnace at $11.50.

Anthracite

Company Price Notices Start Sales of Tonnage

Quotations Higher Than Latest Pre-Strike Figures — Heavy Independent Movement Beyond Pennsylvania Likely, as Producers Say Fair Practice Maximum Is Too Low — Steam Sizes Again Competing with Soft Coal.

New prices have been announced by the companies, who are now releasing the tonnage that had been held at destination pending this announcement. Quotations show an advance over the latest pre-strike figures, presumably to cover the Pennsylvania state tax. Independent domestic sizes are moving within a range of $9@$9.50. The $8.50 maximum set by the Pennsylvania Fair Practice Committee may result in a heavier independent movement to points outside of that state, as many producers say their price must exceed that figure to enable them to operate.

No Lake charters have been reported as yet, although a small amount is dribbling into the Northwest. The movement so far has been almost entirely eastward.

BALTIMORE

Some light supplies have been received. These receipts are all independent coal apparently, which leaves the trade here in a rather peculiar position. The papers have drawn comparisons between the selling price of the retail ton in New York and the retail price in Baltimore as set by some individual dealers.

The freight differential in favor of Philadelphia and New York, however, together with the fact that the New York price is based on the net ton while the Baltimore price is gross by law, proved the big factor in showing that the Baltimore dealer is not getting too much for his coal. Should the day return when the Baltimore dealer can get one-half, or even one-third of company coal, or when the independent price comes down to or near the company price, then the dealer would be warranted in re-adjusting.

NEW YORK

Coal is coming forward in good volume. One of the features of the situation is the difficulty some dealers in independent buckwheat have in disposing of their supplies, although it is said they offered it at company schedule.

Most companies have made known their new price lists and some retail dealers have done likewise. While nothing has been said by the producers regarding their disposition of the Pennsylvania State Tax it is understood that it has been included in the new prices.

Retailers are advertising in the daily papers the fact that coal is coming forward and that those consumers who have not done so should place their orders and that they would be filled in their order. However the State Fuel Administration proposes to see that no consumer secures more than a two weeks' supply at any one time.

Independents are quoting $9@$9.50 for the large coals, although there are reports that some of the smaller operators are exceeding those figures.

ANTHRACITE RETAIL PRICES
(NET TONS)

	Manhattan and Bronx (Labor extra)	Brooklyn and Long Island City (Incl. labor)
Egg	$13.25	$13.50
Stove	13.25	13.50
Chestnut	13.25	13.50
Pea	10.75	11.25
Buckwheat	8.20	8.30
Rice	7.20	7.30
Barley	6.20	6.30

BUFFALO

There is now a little hard coal coming in. So far no price has been made and the coal goes out without a bill. Practically all of the Canadian dealers have already been over here, asking for coal.

All sorts of reports come in from the independent districts. One jobber has obtained a mine price of $12. Another has sold considerable at $13.50.

There is to be Lake coal to load in a week or so, but no charters have been made. There is ample tonnage yet, in spite of the increased loading at Ohio ports.

BOSTON

Dealers are much cheered by early shipments that have already been made. The first cargo of prepared sizes reached Boston on Sept. 22, from Philadelphia, and this will be followed shortly by a dozen or more other cargoes. All-rail, also, considerable shipments have already been made.

There is satisfaction also in the prices announced by the old-line companies. The new basis is regarded as fair to the public.

PHILADELPHIA

When company producers announced their schedule of mine prices, the *Coal Age* forecast last week that an increase of 25c@30c a ton was likely was borne out, as the average increase on the three large sizes figures out 28c. None of the companies has issued a circular and prices are quoted for current shipments only; neither has anything been said about State tax and this item has no doubt been covered in the increases noted above.

The independents as a whole have been somewhat slower to announce prices. As yet it is not known what action the independents will take upon the Governor's statement that maximum prices shall not be higher than $8.50.

Retail prices are far from settled, although it is thought those handling company coal will have a price of about $14.50 for prepared sizes, with $11 for pea. However, those dealers who have been receiving prepared sizes at $9.25@$9.50 have been charging $15 for it, and $12 for pea.

Steam coal prices have been considerably increased by the companies. There is considerable variation in independent prices, with none selling buckwheat under $4 and some as high as $5. The demand for all steam sizes is strong and there is very little free coal on the market.

ANTHRACITE FIELDS

Some of the mines have not as yet resumed operation but in these cases the cause for non-resumption has been due to heavy falls of roof that have to be cleared up first. The condition of the mines really depended on the action of the union locals. Many of the locals were willing for the companies to use sufficient men to keep the mines up while others would not permit any of their men doing this class of work.

Production will be probably kept down by the unions themselves as they do not desire to see any coal in storage when the expiration of the contract comes.

South

BIRMINGHAM

Transportation service is still the greatest matter of concern in this district. Approximately 60 per cent represents the general average of requirements as furnished by all carriers. This situation is responsible for as active a market as now exists for steam coal, demand being slightly in excess of the tonnage being produced. Consumers in general are not getting as much coal or receiving it as promptly as they would like but this is due to car supply alone, which has crippled production and movement from the mines.

Some of the carriers insist on observing the priority regulations, although it is understood that first and second priority classes have been getting more coal than actually required, except in the case of domestic dealers. There is a distinct shortage of this grade in the spot market and inquiry is strong.

Prices on spot steam and domestic grades within the state have practically stabilized on the basis of the fair-price schedule, a slight premium being offered on both grades of fuel for shipment into adjacent territory.

VIRGINIA

Transportation facilities have not been quite so conducive to an increase in the output as was the case earlier in the month so that less than 50 per cent of capacity or about 125,000 tons a week are being produced. There is still a healthy demand, although Eastern markets are becoming more plentifully supplied. Some buyers are making inquiry about domestic, with the result that egg and lump have stiffened in price to some extent.

Chicago and Midwest

Car Shortage and Weak Steam Demand Prevail

Kentucky Mines Average One Day While Illinois and Indiana Fields Work Two Days a Week—Domestic Prices Firm but Others Soften.

Weak transportation and slack demand for steam coal continues. In eastern Kentucky car supply got so bad last week that many a mine worked but one day and some of them got only a part of a day. Western Kentucky service was almost as bad. In southern Illinois the average of 30 per cent continued to prevail while in central and northern Illinois the record was brighter, running up in some sections to a point close to 75 per cent. Indiana was fully as afflicted in most fields as southern Illinois.

While the call for domestic sizes continued fairly good and prices level, steam coal here and there got into trouble so that a general softening of steam prices was noticed. The difficulty of moving steam coal was so marked that a number of contracts for the coming six months were reported. Some of these from central Illinois ran below $2.50. The coal trade in unison prophesies some sort of crisis with the first cold snap.

CHICAGO

The "strike" of big coal buyers is winning its way thus far. Prices on many steam sizes continues to soften under the influence of heavy shipments to this market on consignment so that at the end of the week it was possible to pick up large lots of screenings and mine run at prices ranging from $2.75 down to as low as $2.35 in a few instances where the pinch was felt most keenly by the shippers. Through it all, however, southern Illinois operators steadfastly refuse to drop their circular on steam coal though some of it is getting away unnoticed at figures a little below the $4 bottom quotation. Many producers merely continue to put the slow sizes on the ground if they have no contracts on which to ship it.

The trade is watching sharply for the signing of new steam contracts. It has been held all along that this is the worst time imaginable for the making of such agreements for the future but the fact remains that some producers are breaking loose and making them. Contracts with railroads at least have the tendency to improve car supply to the producer though they do not guarantee it. Much to everybody's astonishment some of these contracts fix prices for the coming winter at somewhat below $2.50—even as low as $2.23 in one case.

Domestic demand continues fairly strong and prices hold quite firm, but dealers have been doing a lot of buying without unloading to consumers as they have anticipated. In other words the householder has not felt the urge yet. A thin flow of smokeless is getting into Chicago and goes swiftly to retailers. The first trickle of anthracite is going to appear within a few days it is quietly predicted by one shipping concern but only a small volume of hard coal is expected before the first of the year.

INDIANAPOLIS

In spite of the fact that there is a serious coal shortage in Indiana there is not the industrial or domestic demand that was expected when the strike was settled. Along with the general unrest in the market come numerous charges from various sections of the state of profiteering in coal.

The Indiana Public Service Commission thinks $4.50 at the mine is fair. It is receiving by each mail letters from all parts of the state that prices are much higher. Brokers are believed responsible to a large degree. An investigation of marketing is to be made. Some coal is selling at more than $5 at the mines. Practically all grades of foreign-mined coal, largely used in Indiana for domestic purposes, are bringing at least $2 more per ton than they did at this time last year. Retail demand is light.

ST. LOUIS

Locally there has been a vast improvement in the past ten days in the matter of domestic coal. The public is waking up to the fact that anthracite, coke and smokeless fuels are not available and they are ordering the next best thing, which at the present time is chiefly Mt. Olive. Carterville is hard to get and the biggest company in St. Louis has refused to take any Carterville orders.

Mt. Olive is selling in greater proportion than all the other coals together. For open market Standard is bringing $4@$4.25, while Mt. Olive for St. Louis is bringing $4 and Mt. Olive at retail is $7.50 and Standard, $6.75. The Standard operators are taking advantage of an outside market to keep prices up and are shipping heavily to Chicago on consignment. Locally and in the country steam is quiet. Country domestic business is good, consumers taking any coal they can get.

WESTERN KENTUCKY

Car supply, which has been especially poor since Northern coal fields resumed, is growing worse. The Illinois Central, during the general strike furnished almost full car supply, while now it is down to about 50 per cent. On the L. & N., car supply is reported at around 18 per cent.

Coal is a little scarce due to the small movement, and prices are slightly stronger than they have been, as there is a fair demand in the Louisville, Memphis, Nashville, Evansville and other close markets, with some demand still from Chicago and St. Louis. Lump coal is scarce and shows indications of further advances. It is quoted $4.75@$5.25, with very little selling at less than $5.

Right now there does not appear to be much prospect of any material improvement in car supply, unless the plan of routing coal cars under other loads in the direction of the owning line, aids in getting them moved from Northern lines. Today it is not a question of getting business but only to secure cars.

SOUTHERN ILLINOIS

A marked decrease in the amount of equipment furnished has almost stopped production at some mines in the Carterville field. The Missouri Pacific and Illinois Central are in the worst condition. The Burlington seems to be in the best shape. Railroad coal throughout the field is moving out heavily and is making great inroads on domestic. It will take at least three months, operators figure, to get caught up on domestic orders on the books now. Steam sizes are slow. There is much dissatisfaction among miners on account of poor working time.

Somewhat similar conditions prevail in Duquoin and Jackson. Work time is better in the Mt. Olive district, except that no cars were furnished for eleven days at one mine on the Chicago & Northwestern. On account of congestion in this field considerable tonnage is moving to Chicago and the Northwest.

In the Standard district some mines are getting from two to three days per week. It is not a question of quality or preparation any more, it is merely a matter of coal. The county fairs in Illinois have helped to keep tonnage down this week for when there were no cars the mines would not work, especially on the Mobile & Ohio.

Steam sizes are slow and hard to move on account of the big plants that drew from this territory in Missouri using oil. The cancellation of Order 23 will help conditions some, but the assigned car order may cause another tie-up if the railroads decide they want all the coal.

The future is not good. Colder weather will mean an increased demand that cannot be met and there is nothing to indicate that car supply or motive power will show any improvement in the next two or three weeks.

LOUISVILLE

Although production of the country is increasing, in Kentucky it is materially off due to the very poor car supply at Kentucky mines, and prices are advancing. Eastern Kentucky is asking as high as $8.25 for lump, while screenings and mine run are low at $5@$5.25. Retailers need coal, but won't buy it at prices quoted, holding that they can't pay the freight, and handling costs, and still sell it at a price that is fair to the consumer. It is reported that the producers of gas coal are getting better demand and a premium of about 50c. a ton.

Hazard field operators reporting only 8 to 11 per cent of cars needed, and Harlan producers report that the situation is even worse there. Western Kentucky is reporting 18 per cent on L. & N., and 50 per cent on the I. C. The Kentucky coal trade believes that some railroads are holding many serviceable coal cars on sidings around over the country that ought to be in service.

Northwest

Prices Softening Some As Cargo Coal Flows In

Stream of Vessels Unloading at Every Dock—Make One-Day Turn-Arounds —Threatened Dock Strikes Cause Much Worry—Anthracite Arrives.

The Northwest continues to have its fretted feelings soothed by a heavy volume of cargo coal that is arriving in record-breaking quantity. Docks are concentrating every effort to make speedy discharges so that boats often make one-day turn-arounds. This coal has already blunted the edge of climbing prices. With all this coal coming in and prices softening the Northwest now worries principally about the threatened dock strikes which might cut off Lake coal during part or all of the remaining weeks in the shipping season.

The other main worry is over anthracite. The first shipments since the strike are just beginning to arrive and various conjectures are made as to whether enough will get through to meet the most urgent wants. Yard remnants are selling around $16, but in Milwaukee it is estimated the retail price for the rest of the winter will be at least $17.

DULUTH

Prices of Youghiogheny, Hocking and Splint have dropped. Coal men say that this is not so much an actual decrease as it is an adjustment to true values. It is openly stated in the trade that those who were asking $12 for lump, $11.50 for run of pile and $9.50 for screenings last week, were profiteering and that the downward revision is only an adjustment to the correct scale. At the dock lump is sold at $9.50 now, run of pile at $9 and screenings at $7.50. This adjustment has proven most stimulating to trade and many orders are being booked. The docks, of course, are absolutely clean, as coal is being shipped out as fast as it is received.

Receipts are passing all precedent. Last week forty-one cargoes arrived and thirty-four more are scheduled to arrive within a day or two. The forty-one cargoes brought in more than 350,000 tons. Docks are handling the rush in a most commendable manner. Boats are given one-day dispatch, which is unusual even in normal times.

The possibility of a seamen's strike and the reported disturbance on Lake Erie docks are the only two dark clouds on the coal horizon at present. If the seamen strike Oct. 1 it will mean that the Northwest will be in trouble, and if a strike occurs on the docks it is certain that a large proportion of the coal being routed to the Northwest will be diverted. If shipments continue as at present it is an assured fact that the Northwest will be all right this winter.

There is a large call for Pocahontas, which is selling at $12 for lump and $10 for mine run. Briquets also are being sold for anthracite substitute, the price being around $10. Coke is going at $11. Three docks—the Pittsburgh, Carnegie and Northwestern—say that they will start unloading anthracite early this week. No one here knows what the anthracite situation will be. Some claim that the seriousness has been over-estimated, and that not nearly the total tonnage estimated will be required.

MILWAUKEE

Milwaukee's coal supply has been materially increased since last week's report, and an easier feeling prevails. There promises to be a continuous procession of coal vessels to this port from now on. Receipts during September thus far aggregate 233,313 tons of soft coal, making the season's receipts by Lake, including 700 tons of anthracite screenings, 1,086,625 tons.

Interest is now centered in the prospective price of anthracite. Word that $8.55@$8.70 has been set at the mine, leads to the prediction that anthracite will cost Milwaukee consumers $17@$18 per ton when the new supply is available. Remnants in town now are selling at $15.75 for egg, $15.95 for nut, and $16 for stove. No anthracite has arrived as yet but a consignment is expected some time during the next week.

The State Fuel Committee intends to prevent dealers from profiteering. The committee is sending a questionnaire to fifty-eight docking companies asking about costs. From this the committee expects to arrive at dealers' real costs and profits.

MINNEAPOLIS

At last cargoes are reaching Lake Superior docks in good number. If this can be continued for a few weeks, stocks will afford a fair promise of meeting the most urgent needs of this country for the early winter. Only about ten weeks of navigation remain. Transportational troubles limit the volume of Illinois coal that might come up here by rail.

The real difficulty is and has been a matter of getting cars to move the coal from the mines to the docks. There may be now and then a shortage of boats at the lower ports for loading. But the primary difficulty has been cars,—always cars. And the same thing is equally true of the all-rail mines.

One effect of the tonnage moving to the docks has been a softening of top prices. There will be an easing off right along, if transportation does not fail entirely. Coal men now believe the Northwest will be supplied with enough soft coal to serve all urgent needs, and with a portion of the usual hard coal tonnage.

Much complaint is made over alleged profiteering. One association of flour millers has set up that Illinois screenings were quoted at $1 at the mine less than a year ago, and are now quoted at $4.50 at the mine.

New England

No Improvement Shown; Market Remains Inactive

Consumer, Well Stocked, Shows Little Disposition to Buy for Future Needs —Current Inquiries Small and Scattered—Car Shortage Severe.

There is no improvement in what is regarded as a very inactive market. Consumers are well stocked and it would take much more attractive prices than are now ruling to induce buying. There is a firm impression that steam coal is bound to be plentiful for months to come and there is little disposition to buy against January or February consumption. The larger corporations have ample reserves and the only current inquiry is from small users scattered all over the territory.

While there is little spot business at Hampton Roads a car shortage has developed sufficiently to curtail mining in certain of the smokeless districts. The market on Pocahontas and New River meanwhile is supported by Western demand.

Prices f.o.b. vessel at the Roads continue to range $7.90@$8.25 per gross ton, but a large proportion of what coal is dumped is applicable on contracts. Railroad piers at this end are so congested that those who have quotas due them are inclined to postpone shipment for the present.

There is a full line of Pennsylvania grades available for spot shipment at prices all the way from $4 per net ton at the mines to $5.50 for quality coals. The market for Tidewater shipments is sufficiently depressed, however, to leave very little opening for rail deliveries within easy range of re-handling points. It is hard to say how there can be any improvement for Pennsylvania coals the next 60 or 90 days.

Delays on British cargoes continue. At certain of the railroads there is delay of more than three weeks, while private docks are also tied up for at least a fortnight, and foreign cargoes are still arriving. Very little of this, however, is offered on the open market, because the great bulk of these deliveries are for account of corporations and other large consumers who made purchases six weeks or so ago.

Eastern Inland

Domestic Coal Is Strong; Lake Dumpings Gain Rapidly

Yard Stocks Being Replenished and Mine Prices Are Up—Steam Stocks Ample and Demand Weak—Buyers Hope for Lower Prices with Close of Lake Season.

Domestic coal is the only strong market feature. Retailers are actively replenishing yard stocks and mine prices are up, with not much free coal offered. On the other hand, steam supplies are ample and demand is weak.

This steam market quietude has been heightened by the passage of both state and federal coal measures. Ohio is to fix prices for her coal and this tends to restrict current purchases to the barest needs. Then too, the buyer feels that with the Lake season closed, enough tonnage will be thrown on the commercial market to soften prices. Lake dumpings are rapidly increasing and shippers are still hopeful of moving 15,000,000 tons this season.

CLEVELAND

Dull and listless market conditions continue. Supplies are ample and the demand is weak. The feeling of consumers that prices would fall is being justified by the event. Mine run is selling around $4. This is a drop of 50c. in a week and nearly $4 a ton in a little over a month. Market quiet has been heightened by the train of developments leading to the special session of the legislature, the passing of the fuel control bill and finally the appointment by the governor of a state fuel commission. This commission is now taking up the problem of fixing prices. No attempt will be made to fix a flat rate for the entire state. Pending these detailed arrangements, consumers are reducing their requirements to pressing immediate needs.

Lake movement is making excellent headway. The Ore & Coal Exchange, which has the plans for expediting the vessel shipments, is still aiming at a total movement for the season of 15,000,000 tons.

Pocahontas is beginning to arrive in restricted quantities. Dealers are about four weeks behind in their deliveries and orders are being filled as rapidly as the fuel is available. Shoveled lump is selling for $12.75. Practically no anthracite is being received.

PITTSBURGH

Production is at the limit of car supply and there is no prospect of any material change in this situation in the near future. In some quarters there is complaint that too many loaded cars have been allowed to go to the Lakes but such criticism is not universal. Perhaps as a reflection of consuming points enjoying priorities having as much coal as they can unload, the Pennsylvania a few days ago suspended all priorities.

There is a fairly open market for buyers having priorities, and more or less opportunity for others to buy, in small quantities. It appears that occasionally byproduct ovens can buy coal in the open market but in general such business can hardly be put through.

Prices show a wide range, partly because of there being many coals of somewhat indifferent grade in the market, such as are not produced in normal conditions. Indifferent steam coal ranges $4@$4.50 for mine run. Better and best grades range up to $5. Good domestic lump is $5.25@$5.50. The Pittsburgh Coal Co.'s "circular" prices, although no actual circular has been issued, are $4.75 for slack, $5 for mine run and $5.25 for domestic 1¼-in. lump. Connellsville steam is around $4.25.

COLUMBUS

Domestic grades are the strongest point in the market while steam has shown a marked reaction in price. Production is going along as well as possible under the circumstances. Available coal is quickly bought up but steam users are loath to pay the extreme high prices and quotations have sagged considerably. Lump from all fields find a ready sale around $6 and even higher. The larger part of the tonnage coming in is Hocking and Pomeroy. Retail prices are rather high with Hocking and Pomeroy selling $8@$9.50, and West Virginia splints, $9.50@$11.

Lake trade is slowing down because of the high prices asked. One contract was made recently at $4.50 for Hocking mine run, where the Lake shippers will screen the coal and take the lump and resultant size. Shipments over the H. V. Docks at Toledo during the week ended Sept. 20, were 164,570 tons, as compared with 121,769 tons the previous week, making a total of 2,148,723 tons for the season.

EASTERN OHIO

During the week ended Sept. 16, mining operations were speeded up and the output exceeded that of any week since the settlement of the strike. Production was 325,000 tons as contrasted with a potential capacity of 630,000 tons, or 52.5 per cent. The 300,000 tons lost is chargeable in the main to car shortage. Thirty per cent of capacity has been produced so far this year.

Unless improvement can be had in the transportation situation, it does not appear that the mines in this district will be able to operate over 50 per cent of full time. However, with the striking shopmen returning to the roads, the trade is more optimistic.

The so-called "buyers' strike" is, no doubt, attributable to two causes; First, a concerted movement among buyers to prevent any scramble for fuel which might evolve a runaway market, and second, the appointment of a fuel administrator in Ohio under the legislation recently inaugurated and the expectation that the fair prices which are to be named by him may possibly be under those now prevailing in the spot market.

It is estimated that about 60 per cent of eastern Ohio's output is being sent to lower docks for the consignment to the Northwest and steam users, no doubt, feel that when the season of navigation closes ample supplies will be obtainable for storage purposes. A reactionary tendency in spot prices has accompanied the lack of urgent demand and quotations are slightly lower than last week.

Bituminous coal receipts at Cleveland during the week ended Sept. 16, were the largest in some weeks; industries received 726 cars and retail yards 142 cars, this being an increase of 171 cars over the preceding week.

DETROIT

The modification of Service Order 23 has created a more optimistic feeling among industrial and domestic consumers and the belief is expressed that a larger movement will soon be directed into the city. The buying that is now being done seems to come almost entirely from steam consumers who are obliged to come into the market to provide for current requirements.

Hocking lump and egg is quoted at $6.50 f.o.b. mines, while mine run is $5.25 and slack, $5. Fairmont and Pittsburgh No. 8 take about the same price. Lump and egg from Kentucky and West Virginia is $7, mine run, $5.50, and slack, $5.25@$5.50.

The deficiency in the anthracite supply is occasioning much uneasiness. In many Detroit homes the heating equipment is of a character unsuited to use of any fuel except anthracite or coke and the supply of the latter is nearly as short as is anthracite.

BUFFALO

Consumers refuse to buy at all liberally, no matter how the matter of car shortage is set before them. They are bound that the price is coming down and as they have coal they hold off.

Railroads have cut down the mines to about 30 per cent of capacity and even then fail to furnish that amount. It is now reported by some of the leading local railroad officials that the worst of the car shortage is already over, on account of the return to work of so many shopmen, but the shippers are not willing to accept a mere statement of that sort. As a rule shippers believe that we are just at the beginning of the worst shortage in the history of transportation. It really looks that way.

Prices range $5.25@$5.75 for Pittsburgh ¾-in., and $4.75@$5.25 for Allegheny Valley mine run. Slack sells a little higher than mine run. Add to these figures $2.09 for Allegheny Valley and $2.24 for Pittsburgh for freight.

NORTHERN PANHANDLE

There is an active demand at the Lakes for the output of the region although there is a disinclination on the part of the Lake buyers to pay the current market prices. Northern shipments are as large as railroad facilities will permit. A large percentage of the output is being utilized by the carriers. Some producers are shipping by water in view of curtailed rail transportation.

Cincinnati Gateway

Combination of Events Makes Market Uncertain

Softness at Tidewater, Price Fall at Fairmont, Aloofness of Lake Buyers and Change in I. C. C. Order Influence Trade—Buyer Now Better Able to Obtain Fuel at His Own Figure.

Softness of the market at Tidewater, falling prices in the Fairmont field, a general disposition of Lake buyers to remain aloof and a modification of the I. C. C. Order 23 all militate against an easy or set swing to the market. There has been a lot of running around to find out which way things were heading, a general uncertainty as to what might be expected and a disposition to go warily lest there be some untoward change that might upset the best of calculations.

The market in the meantime has developed its own soft spots, with steam coal edging off in price and an ability of the buyer to get fuel at his figures more readily than he has been in the past three months.

HIGH-VOLATILE FIELDS

Kanawha

Partial paralysis of transportation is still the most potent factor in retarding production. During the week ended Sept. 16 mines were not able to produce more than 40 per cent of potential capacity. There is a better demand in Western markets than in the East. The call for prepared sizes is becoming much more active. Little coal is being prepared, however.

Logan and Thacker

Logan mines have been greatly handicapped by exceedingly poor transportation facilities, the car supply not being equal to much more than 35 per cent of rating. There is little free coal available. There is a growing demand for domestic grades with little to be had, so that prices have stiffened to some extent.

Inroads were made on production in the Kenova-Thacker region by a shortage of cars but notwithstanding this the field is producing more coal proportionately than some other high-volatile regions. The Western movement is far from being satisfactory, however. Railroad fuel consumption is heavy. In common with operators in other fields, Kenova-Thacker producers observe a stronger demand for egg and lump owing to the necessity of retailers restocking.

Northeastern Kentucky

Demand is still much in excess of the output, which is not more than 30 per cent of potential capacity or less than 100,000 tons a week. Most of the priority orders placed in this region having been filled, the mines are now shipping on regular business. Railroads are securing a good deal of coal and some is also going to the Lakes.

The fact that demand is outstripping the supply of domestic is responsible for increased prices on lump coal, ranging up to $6.50.

LOW-VOLATILE FIELDS

New River and the Gulf

New River mines are still working on an open-shop basis, but the car situation is extremely bad and precludes more than a 40 per cent production. Market conditions are conducive to a larger output than the transportation situation permits, yet very few producers are securing more than the Hoover price of $4.50. There is a growing demand for prepared coals and for mine run in the West. There are a few priority orders still in evidence but they are not numerous, the various committees having virtually ceased to function.

Winding Gulf mines are handicapped to about the same extent as New River. Production losses are still averaging about 150,000 tons a week as against an output of little more than 100,000 tons a week. For such coal as is produced there is a fairly active demand with comparatively little fuel from this field shipped to Western markets, owing to the difficulty of getting such coal through. Priority orders have largely ceased.

Pocahontas and Tug River

Pocahontas mines are faring better than those in other smokeless territories, owing to more satisfactory transportation conditions. The greatest difficulty is in getting coal to Western markets where there is sufficient demand to justify a large movement. The N. & W., however, is able to transport more coal to Western points than other lines operating in southern West Virginia. The bulk of the output is going to Tidewater and to Eastern markets where the demand is not very urgent and where there is a probability that the markets will be glutted with coal before long.

Tug River mines are situated just about the same as Pocahontas. There is also in Western markets an active demand for byproduct coal and for fuel for steel companies having subsidiaries in the West. There are no longer many priority orders in effect. Prices as a rule are not ranging much above the Hoover price level, except as to prepared grades, which are scarce.

CINCINNATI

The buyers' strike—if it may be so called—still continues and the most notable effect has been the number of suspensions of orders and rejections by Lake buyers. There, where all the handlers of coal expected the market to be the strongest, it is the weakest. The consequence of this has been to throw a heavy tonnage on markets which are not absorbing the coal as they used to. The refusal of domestic buyers to take coal in quantity has had its effect too. Whether this attitude or the fact that more mines are now turning out domestic sizes is the cause, in any event there has been a drop of $1 on some of the offerings.

The smokeless situation has developed some different curves. More and more New River is being offered through the jobbers. Old-line firms are still offering to book orders at the Hoover prices but with the stipulation that the buyer must wait his turn. Spot shipments are taking a premium, New River and Pocahontas lump selling up to $7.50 and mine run up to $6.50.

The retail situation still continues tense. There was another boost in price this week, one firm advancing bituminous lump to $10.50, and mine run to $9. Other firms have hesitated in following suit, the range of prices being: Smokeless lump, $10.50@$12, bituminous lump $8.75@$10.50, smokeless mine run $9@$10, bituminous mine run $8@$9, slack, $7@8.

West

SALT LAKE CITY

Three or four retail yards have been closed during past week, in some cases for want of coal. Many dealers refused to buy coal during the early part of the summer thinking the price would drop. Then came a shortage in other states and coal produced here went elsewhere. Today, local yards have trouble getting fuel.

Following the announcement that a grand jury investigation would be made into the recent raise of $1 a ton, retail demand fell off. Neither operators nor dealers seem to be worrying very much over the investigation, which is regarded as a political move.

Car supply totals only 75 per cent, on some lines. Operators in afflicted zones regard the outlook as rather gloomy in view of the bumper crops that must be moved.

KANSAS CITY

The coal business is getting back to normal, though domestic demand is surprisingly low. It may be that householders expect prices to drop. Some of the dealers lay the light demand to fuel. There are more than a dozen concerns here in Kansas City, who are putting out oil burning equipment and they are all busy taking orders and installing heating equipment.

DENVER

The shortage in the car supply is causing serious concern. Northern Colorado lignite fields are practically the only districts in the state getting anywhere near the normal supply.

The Victor American Fuel Co.'s mines, in Routt County, have been operating only 5½ hours this month.

Price increases at the mines vary from $1@$1.50 per ton. The conservative operators are only asking $1 above the Sept. 1 price.

News Items From Field and Trade

COLORADO

Lack of railroad transportation facilities has resulted in the shutting down of 50 per cent of the **Colorado Fuel & Iron Co.'s** mines in the state, according to officials of that company. Other operators report they are unable to secure a sufficient number of cars to carry on normal operation of their mines. There are plenty of cars in Colorado, but there is a serious shortage in locomotive power, due mainly to the strike of the railroad shopmen.

CONNECTICUT

The Elm City Coal Co., New Haven, has surrendered its corporation rights to the state. The company was incorporated in 1920, but it never commenced business.

P. Cutler, Inc., Colchester, has been incorporated under the laws of Connecticut, to engage in the general coal business. The capital stock is $50,000, and the incorporators are Pincus, Samuel, M. A. and S. B. Cutler, all of Colchester.

ILLINOIS

W. J. Dunkley, gas engineer of the Urbana station of the Bureau of Mines, recently completed a test of a mixture of coal and coke in water-gas manufacture at the city gas plant at Ottawa. Mr. Dunkley has visited gas companies at Aurora, Joliet and Moline, and Davenport, Iowa, ragarding investigations proposed to be conducted at these plants.

The Old Ben Coal Corporation of Chicago has reopened its No. 17 mine at Johnston City. It has been shut down since early last January. In closing the mine last winter, Superintendent John White ordered all miners' tools out and the rumor was started that the mine was to be abandoned by the company. However, a new tipple has been built and other improvements made, and it will be running full blast again in a few days.

A report recently compiled by **County Mine Inspector Edward Flynn** of Perry County shows a total of 2,234,231 tons mined in that county for the fiscal year which ended June 30, 1922. Thirty-two mines were in operation during the year, twenty of which are classed as shipping mines and twelve as local or wagon mines. The thirty-two mines employed 3,684 men.

Coincident with the leasing of the coal mine at Ellisville, Fulton County, to **W. B. Hawkins,** of Galesburg, and **William Donaldson,** of Cuba, by the **Spoon River Colliery Co.,** of Rock Island, the announcement is made that **William A. Schaeffer,** president and manager of the company, has resigned. His interests were sold to C. J. Stasehofski. Mr. Hawkins and Mr. Donaldson represent the **Ellisville Coal Mining Co.** recently organized for the purpose of taking over this lease. The period of the lease is for five years, the Spoon River company retaining the company store and continuing a jobbing business. The lessees will sink another shaft and will double the output of the mine.

L. E. McKittrick, cashier of the American National Bank of Mount Carmel, has taken title to the **Powell Coal Co.,** mine, three and one-half miles west of that city. The force of men at the mine will be greatly increased. The name of the pit has been changed to the **Black Diamond Coal Mine.**

Gus Wenzelman, manufacturer of Galesburg, is planning to sink a coal mine near Rapatee.

It is planned to double the daily tonnage of the **Gulf Mine** at Sparta, and to have it producing at the rate of between 4,000 and 5,000 tons daily. A new concrete tipple has been built.

INDIANA

The property of the **Rowland Powers Consolidated Collieries Co.** was sold at public auction recently at Brazil by James A. Cooper, receiver. The properties said to be valued at more than $1,000,000 were bid in by stockholders for $320,000. The company operates extensive holdings in Clay, Greene and Owen counties and was forced into receivership when mining was suspended last April. During the strike the state took over strip mines of the company and began production under a military guard. It is said the stockholders, who purchased the property, will reorganize and continue operations.

The Indiana & Eastern Coal Co., Indianapolis, has increased its capital stock from $25,000 to $75,000.

The Columbus Mining Co., with headquarters in Chicago, has lately acquired the McClelland mine at Riley, near Terra Haute, and is now re-equipping the plant, expecting to develop the mine fully. At present only half the mine is operating, but the car supply is well maintained on the Big Four, serving the field, and an output of eighteen cars a day is going forth regularly.

With a capital of $10,000 the **La Verne Coal Co.** has been organized at Jasonville. The directors are Patrick H. McKerr, Enoch Evans and William Whittington.

The Star City Coal Mining Co., of Indianapolis, has increased its capital stock from $100,000 to $250,000.

The Saxton Coal Co. has been organized at Sullivan, with a capital stock of $100,000. The directors are Hinkle C. Hays, Alonzo C. Owens, W. Paul Stratton and John S. Taylor.

The Jasonville Fourth Vein Coal Co., at Jasonville, has filed a preliminary certificate of dissolution with the secretary of state.

The Mt. Pleasant Coal Co., Terre Haute, has filed papers of incorporation. The articles show a capitalization of $25,000, and the officials of the firm are George R. Wilson, president; J. J. Hafer, vice-president, and L. D. Scott, secretary and treasurer.

KENTUCKY

It is reported from Falmouth, that **J. V. Oldham,** of that point had filed records of options on lands on the Licking River, three miles above the city for a **$7,000,000 water power project** at that point to furnish current to cities and towns in central and eastern Kentucky, and mines in some sections of northern and eastern Kentucky.

The O. K. Coal Co., Whitesburg, has been formed by W. C. Dixon, H. D. Caudill and others, to operate a string of wagon mines. Wagon mines are quite active at present prices, and by grouping the output the owners are able to load cars promptly and secure better rail service.

R. C. Simpson, general superintendent of the Kanawha Elkhorn Collieries, Inc., for the past four years, has resigned his position and will be succeeded by **J. L. Morgan,** mining man, and at present mayor of Pikeville.

Governor Morrow has disbanded the **Kentucky Fuel Committee** which, while it lived, was one of the most active of the state emergency boards.

A number of new Kentucky coal companies have filed charter articles the past few days, the list including the following: **Noble Coal & Lumber Co.,** Whick, capital $12,000, G. W., Martha and Pearl Noble, all of Whick; **Dixie Blue Gem Coal Co.,** Nevisdale, $10,000, G. C. Croley, Ben Croley, and Ester Croley, all of Nevisdale; **Broad Bottom Coal Co.,** Pikeville, $12,000, J. J. Christie, Broad Bottom; H. S. Funk and Isabelle Music, of Sutton.

MINNESOTA

J. H. Sanford, president of the **Carnegie Dock & Fuel Co.,** and **J. A. Howe,** vice-president and general manager, were at Duluth on an inspection tour recently. They made a statement that they had large supplies of coal ready to move to Duluth, and that it was possible that the dock might fill all its orders this season.

A city committee on fuel has been named in Minneapolis by Mayor Leach, to carry out coal conservation and distribution policies. It is headed by W. A. Eggleston, real estate man, as temporary chairman. It includes representatives from retailers, public utilities, union labor, motion pictures, manufacturers and others.

Governor Preus has proclaimed a **wartime fuel basis** for fuel for Minnesota.

NEW YORK

The Cheswick Coal Co. has opened an office at Buffalo, with John A. Hatch, formerly with the Pittsburgh Coal Co., as manager.

G. J. Schnabel and **E. A. Kalle** for many years connected with the coal traffic department of the N. Y. C., and **Oscar Schnabel,** formerly with the sales department of W. A. Marshall & Co., are opening an office in the Grand Central Terminal for the purpose of handling anthracite and bituminous coal.

OHIO

The Consumers' & Manufacturers' Fuel Co. is the name of a new company, chartered in Columbus, with a capital of $30,000 to sell directly to the consumer. In a letter to Governor Harry L. Davis, H. H. Sisson, president of the company, advised that it is planned to sell direct at a profit not to exceed 50c. George C. Bobb, a wholesale grocer of Columbus, is treasurer of the company.

The Burns Coal & Supply Co., a retail concern, has opened a wholesale department in Columbus for the jobbing of coal, with Edward Sharfenaker, president, in charge.

Edsel Ford, son of the Detroit auto manufacturer, accompanied by **E. Sorenson,** in charge of coal purchases, **William Diehl,** purchasing agent, and **Abner Lunsford,** in charge of the Ford mining properties in southeastern Kentucky, were visitors to the Cincinnati market on Sept. 20. Mr. Ford's representatives gave out the statement in which they said the purpose of the visit was to look into transportation possibilities for the movement of coal.

With the strong demand for coal there has been a flood of new corporations for mining and distribution purposes. There has been on the average of a half dozen a week chartered under Ohio laws. Among the number are the **Jobs Coal Co.,** of Nelsonville, capital $25,000, to mine coal near Athens; incorporators, F. M. Rosser, Pearl Rosser, C. Douglass, D. W. Gibson and F. L. Gibson; **Blue Ridge Coal & Dock Co.,** Cleveland, 500 shares, no par value designated; Elmore L. Andrews, David A. Gaskill, Clay Dietrich, Jerome C. Fisher and J. Frank Pease; the **Edgemount Fuel & Mining Co.,** Columbus, capital $5,000; R. M. Hunter, M. L. Bush, R. L. Spencer, Barton Griffith, Jr., and S. A. Senter; **Crawford-Wheeler Coal Co.,** Cadiz, capital $25,000, Clyde Wheeler, Henry E. Crawford, John W. Crawford, Frank B. Grove and W. C. Clifford; the **Penn Coal Co.,** Columbus, capital $50,000, to mine coal in Crooksville district, J. W. Blower, E. W. Blower, Ethel Voolker, Ruth Blower and S. J. Lewis; the **Ohio & West Virginia Coal Co.,** Columbus, capital $50,000, to mine coal in southern Ohio and West Virginia, D. H. Armstrong, D. F. Shafer, E. R. Davis, S. M. Hanley and O. P. Amann.

OKLAHOMA

The Coal Miners' Extension Course, Oklahoma School of Mines, started in February of this year, and is now flourishing with an enrollment of 200 students. It is now possible for those desiring to take the state examinations for certified positions to obtain the required amount of education. Tuition is free to all state residents. Information: Oklahoma School of Mines, Coal Mine Extension, Dept., Wilburton.

PENNSYLVANIA

A charter has been issued for the **Marshfield Coal Co.,** Rohrersville, with a capital stock of $20,000. Its purpose is mining and selling coal. James H. Collier, Minersville, R. D. No. 1, is treasurer and he with James B. Neale and James H. Pierce, Minersville, R. D. No. 1, incorporated the company.

The Laurel Coal Co., Clearfield, $50,000 capital, has been formed. A. Houst, Houtzdale, is treasurer. Purpose: Mining, shipping and selling bituminous coal. Incorporators: Joseph Jurcak and John Jurcak, Anita and Peter Jurcak, DeLancey.

H. B. Powell, president of the County National Bank of Clearfield, recently purchased 367 acres of coal land near Frugality, Cambria County, at a public auction held at Ebensburg. The price paid was $10,950. This land was sold under partition proceedings, it being owned jointly by the A. B. Shaw estate, the Israel Test estate and the Philip Dott estate.

The Weston Dodson Co. has taken over the mine of the **Shipman Coal Co.,** near Shamokin.

Maderia Hill & Co., will operate the mines of the **Mill Creek Coal Co.** These include the Middle Lehigh Colliery at New Boston, which in 1917 produced 126,323 tons, the Morea Colliery, at New Boston, which produced 378,869 tons, and the Wolf Creek Colliery, also at New Boston, which produced 49,131 tons.

A deal has been closed whereby the **Maurer Coal Mining Co.** with offices and workings at Patton, Cambria County, purchased the holdings of the **Glasgow Fuel Co.**, at Glasgow, same county. The deal involves a modern tipple with a 200 ton capacity and a tract of coal land of 240 acres. The Maurer company has also started a new operation at Mahaffey on a tract of 250 acres under a sub-company named the **Mahaffey Coal Mining Co.** The sidings are completed and the mine will produce 200 tons daily.

The following coal companies have notified the State Department of increases in capital stock: **Mason Heflin Coal Co.**, $68,900 to $69,350; J. W. Mason, president, Philedalphia. **Mason Adams Coal Co.**, $40,300 to $44,750; J. W. Mason, president, Philadelphia. **Salem Gas Coal Co.**, $50,000 to $300,000; R. H. Jamison, president, Westmoreland County.

George E. Alter, Attorney General, will appear before the United States Supreme Court, Oct. 2, to ask that the argument of the appeal in the matter of the **Pennsylvania anthracite coal tax law** be advanced because of the importance the tax question bears to the general financial situation of the Commonwealth.

Coal companies recently issued charters include: **Montour Collieries Co.**, Pittsburgh, capital $200,000; treasurer, C. C. McGregor, Crafton. Incorporators are W. J. Gillilan, Pittsburgh; C. C. McGregor, Crafton and R. B. Haverstick, Crafton. **Penn-Brook Coal Co.**, Smethport, $300,000; treasurer, F. L. Holmes, Smethport. Incorporators: W. H. Gallup, Crosby; F. L. Holmes, Smethport, and J. Orin Wait, Erie.

The Ida Belle Coal Co., Indiana County, has notified the State Department of an increase in its capital stock from $5,000 to $100,000. Harry W. Fee, Indiana, is president.

The Titan Fuel Co., recently opened an office in Johnstown, with J. D. Monie in charge as vice-president. Mr. Monie was the New York representative of the Johnstown Coal & Coke Co. and was also connected with the Tidewater Coal Exchange.

The Superior Connellsville Coal Co. has filed notice at the State Department, Harrisburg, of an increase in its indebtedness from $810,000 to $1,250,000. George Whyel, Pittsburgh, is president.

The Winfield Coal Corporation, a Delaware corporation, has registered with Pennsylvania as a foreign corporation which will do business in Pennsylvania. It will maintain an office at 529 Fulton Bldg., Pittsburgh.

Deeds filed record the transfer of two tracts of coal land in Dunkard township. The sale was made by the **Piedmont Coal Co.** to the **Greene County Coal & Coke Co.**; consideration, $45,022.10. One tract was an undivided 16-22 interest in 230 acres and the other an undivided 16-22 interest in seven acres and 122.9 perches. Jesse R. Scott, of Waynesburg, has sold to the Piedmont company an undivided 4-22 interest in four tracts of coal land in Dunkard township, containing 145.9278 acres and 127.2 perches, and an undivided 2-22 interest in 9 acres and 109-6 perches. Nelson Rogers, of Cleveland, has sold an undivided 1-22 interest in the same tract named in the Scott deed, to the Piedmont company. the aggregate acreage being 168.9278 acres and 119 perches, for which the consideration was $6,743.29.

C. E. Reese, editor of the *Gas Engineering & Appliance Catalog* and associate editor of the *Gas Age-Record*, has joined the stoker sales department of the Westinghouse Electric & Manufacturing Co., at South Philadelphia. He was previously with Henry L. Doherty & Co., and assistant engineer of the Illinois Public Utilities Commission.

President Rush N. Hosler of the Coal Mining Institute of America was a recent Pittsburgh visitor.

The State Department of Labor and Industry reports that despite the resumption of coal mining in Pennsylvania there were 115,000 of the 300,000 miners who were involved in the strike holding out on Sept. 15, the time of the semi-monthly reports issued by the various branches of the State Employment Bureau. The result is that in some of the bituminous coal mines there is a shortage and in the anthracite field the condition is such that full production is not expected until late in October.

TEXAS

The Dickinson Ice & Fuel Co., of Dickinson, has been organized and charter filed with the secretary of state. The company will conduct a retail ice and coal business. The company is capitalized at $20,000 and the incorporators are: J. Falco, Nick Falta, C. Falco and others.

The Industrial Coal Co., of Palo Pinto, has been organized and incorporated under the laws of Texas. The charter filed at Austin shows a capital stock of $10,100. Incorporators are: E. J. Elam, J. A. Moore and H. H. Milling. The company will mine coal in Palo Pinto County.

The Channel Fuel Co., of Houston, has filed an amendment to its charter, increasing the capital stock from $100,000 to $200,000.

UTAH

E. A. Greenwood, an employee of the **Utah Fuel Co.** for more than forty years has been promoted to the position of treasurer. The treasurer's office of this company will be removed from New York to Salt Lake City.

Mine Rescue Car No. 9 of the United States Bureau of Mines will constitute an exhibit of the Utah State Fair at Salt Lake City, Oct. 2 to 7. The car will be stationed at Bingham either immediately before or after the fair for the purpose of giving mine-rescue and first-aid training to the employees of the large copper-mining operations in that vicinity.

VIRGINIA

C. H. Meade, president of the C. H. Meade Coal Co., and large coal operator, has moved his home from Beckley, W. Va. to Norfolk, where his headquarters were recently opened.

W. D. Mills, assistant sales manager of the Raleigh Smokeless Fuel Co., Beckley, W. Va., has been transferred to the Norfolk office.

Harry Teagle, manager of the **Dexter & Carpenter** branch, at Norfolk, has returned from the company's operations at Bluefield and Twin Branch, W. Va. The Bluefield office of this company has been closed and its inland business transferred to the Norfolk office.

Tracts of coal land in Henrico and Chesterfield counties will be developed by the **Henrico Coal Corporation**, organized with Frank Hagan, president; J. E. Norvell, secretary, and $250,000 capital.

WEST VIRGINIA

The Lebbo Gas Coal Co. has been organized by Grafton people with a view to developing coal lands in Eagle District of Harriston County. This concern is capitalized at $50,000, headquarters to be at Grafton. Active in effecting an organization of the company were, J. Clyde Lewis, Howard K. Burrell, A. K. Lewis, Nona Hassion and Glenn C. Burrell, of Grafton.

Organization of the Roman Coal Mining Co. presages the development of coal territory in Marshall County. This company was capitalized with 200 shares of no par value. Chiefly interested in the new enterprise are: George W. Roman, John Williams, George A. Blackford, A. Tegarden and Z. F. Robertson, all of Wheeling.

The Robinson Fuel Co. has been organized for the purpose of mining coal in Cass District of Monongalia County, this company being capitalized at $25,000. Headquarters of the concern are to be at Maidsville. Identified with the new company are: A. W. Bowlby, Wilson C. and William J. Jamison and R. F. Lazzell of Morgantown and Ira Donley of Green County, Pa.

As to whether continued residence in a coal company's house after refusal to work constitutes contempt of a federal court injunction is a question which Judge George W. McClintic of the United States District Court for the southern district of West Virginia will determine, when R. S. Holley, a striking miner appears before him to answer a rule requiring him to show cause why he is not in contempt of court for refusal to move. Application for the rule against him was made by the **Carbon Fuel Co.**, operating near Charleston. If Holley should be adjudged guilty of contempt, it will establish a precedent, attorneys assert, insofar as the use of houses owned by companies obtaining an injunction is concerned.

J. H. Dean, who is the vice-president of the W. E. Deegans Coal Co., of Huntington, was a visitor in the West during the early part of September.

The Amelia Coal Co. plans to mine coal in Kanawha County, having been recently organized with a capital stock of $25,000. Offices for the present are at Charleston. Principally interested in the new company are: M. I. Hill, William Crichton, Jr., Edwin M. Keatley, A. D. Brummett and William A. Crichton.

The Elm Grove Coal Co., operating at Elm Grove, near Wheeling, in the Northern Panhandle, has completed plans for the erection of a coal tipple at its No. 1 mine. The contract for its erection has already been awarded. The company estimates that it will be able to increase production to the extent of 2,000 tons a day with the new tipple in use.

A tract of between 500 and 600 acres of Pittsburgh coal in Cass District of Monongalia County brought $200,000, this property being acquired by two well-known coal men of Morgantown, **W. K. Hatfield** and **J. J. Reynolds**, the tract being known as the J. Calvin Morris tract. The tract so acquired is on Doll's Run and is reached by the Morgantown & Wheeling. The new owners of the Morris tract plan to open the coal for development just as soon as it is practicable to do so but will have to sink a shaft in connection with any development work which may be undertaken owing to the fact that the coal is about 400 ft. below the surface.

The Real Pocahontas Coal Co. will engage in the production of coal in McDowell County, just having been organized with a capital stock of $25,000. This company will operate in the vicinity of Iaeger, the general headquarters of the company. Interested in the new concern are: W. H. Coleman, Matilda J. Coleman and A. M. Cline of Kenova, and Dollie Cline and E. W. Cook of Iaeger.

The United States Coal & Coke Co., Gary, is going to use bone coal, which was formerly considered waste, as a boiler fuel. To this end it is installing the new power plant, two mills for pulverizing coal, a distributing system for conveying the pulverized fuel from the mills to the furnace bins. Each 800 hp. boiler will be equipped with five vertical burners, taking the fuel from five 3 in. screw feeders.

ALBERTA

The Blue Diamond Coal Co., Ltd., of Alberta, owned jointly by the McIntyre and Temiskaming mining companies, has issued a financial statement for the year ended June 30, showing operating profits of $166,276 and net profits after deducting taxes, interest, etc., of $55,498. The previous report, after deducting all charges, showed a net deficit of $157,127. Total assets were $2,532,284 compared with $2,311,893 for the previous year.

BRITISH COLUMBIA

While the results of the inquiry into the cause of the disaster which occurred in No. 4 mine of the **Canadian Collieries (D) Ltd.**, near Cumberland, have not been announced the opinion is held that the explosion had its source in the ignition of gas in a cavity on the side of the roadway. The electric wiring connecting the coal cutter was dislocated and whether there was a flame at this time or whether there was a shot fired which ignited the gas are points which are expected to be cleared up.

George S. Rice, of the United States Bureau of Mines, who has been in British Columbia on unofficial business relative to gas outbursts in the Cassidy (Vancouver Island) coal mines, **Granby Consolidated Mining & Smelting Co., Ltd.**, has left for the East. It is understood that Mr. Rice was engaged by the company to make an examination of underground conditions at Cassidy and submit recommendations as to how best to deal with serious operation problems with which the management has been faced of late.

WASHINGTON, D. C.

The personnel of mine rescue car No. 2 of the United States Bureau of Mines recently conducted **first-aid and mine rescue training** in the Trinidad and Walsenburg districts. At Trinidad, a first-aid course was given for Boy Scouts. First-aid and mine rescue training has been conducted by the crew of car No. 3 at State College, Coalport and Madera, Pa. Excellent co-operation was received from both operators and miners, the latter taking the training on their own time. The crew of car No. 8 recently gave training to students of the University of West Virginia, at Morgantown, in conjunction with the short course in coal mining.

Association Activities

North Dakota Lignite Coal Operators' Association

The publicity and advertising campaign of the association has opened, calling attention to the seriousness of the coal situation and asking that people immediately lay in at least a part of their supply of coal.

The operators' association is planning to embark upon a long campaign of education, advertising and publicity in regard to the use of lignite coal.

National Coal Association

On the Railroad Relations Committee of the association, appointed to serve from June 1, 1922, are the following: Mahan, E. C. (chairman), president, Southern Coal & Coke Co., Knoxville, Tenn. Heiner, Moroni, vice-president, U. S. Fuel Co., Salt Lake City, Utah. Honnold, F. C., secretary, Coal Operators' Associations, Chicago. Hutchinson, S. Pemberton, president, Westmoreland Coal Co., Philadelphia. Jenkins, C. H., vice-president, Hutchinson Coal Co., Fairmont, W. Va. Maloney, A. J., vice-president, Chicago, Wilmington & Franklin Coal Co., Chicago. Yerkes, S. L., vice-president, Grider Coal Sales Agency, Birmingham. Andrews, W. L., vice-president, Consolidation Coal Co., Baltimore. Barger, D. H., president, Smokeless Coal & Coke Co., Shawsville, Va. Boyd, C. D., traffic manager, Hazard, Harlan & Southern Appalachian Coal Operators' Association, Louisville, Ky. Buffington, W. P., traffic manager, Pittsburgh Coal Co., Pittsburgh. Goodyear, C. J., traffic manager, Pittsburgh Coal Producers' Association, Pittsburgh. Harwood, F. H., traffic manager, Illinois Coal Traffic Bureau, Chicago. Higgins, S. C., traffic manager, New River Coal Operators' Association, Box 336, Mt. Hope, W. Va. Holly, W. A., traffic manager, Central Illinois Coal Traffic Bureau, Chicago. Hoy, C. P., traffic commissioner, Fifth and Ninth Districts Coal Bureau, St. Louis. Hurd, D. F., secretary, Pittsburgh Vein Operators' Association of Ohio, Cleveland. Jones, Cadwalader, vice-president, Marrowbone Mining Co., Box 130, Ashland, Ky. Jones, J. S., president, Sunday Creek Coal Co., Columbus. McElwain, John, vice-president, W. J. Rainey, Inc., New York City. Manley, W. J., traffic manager, Logan Coal Operators' Association, Logan, W. Va. (Temporary address, c/o National Coal Association, Washington, D. C.). Meehan, H. J., president, Cosgrove & Co., Johnstown, Pa. O'Neill, Charles, general secretary, Central Pennsylvania Coal Producers' Association, Altoona, Pa. Richardson, C. F., president, West Kentucky Coal Co., Sturgis, Ky. Waffle, Jonas, secretary, Indiana Coal Trade Bureau, Terre Haute, Ind. Warner, C. E., traffic manager, Southwestern Interstate Coal Operators' Association, Kansas City, Mo. Yarborough, A. R., traffic manager, Kanawha Coal Operators' Association, Kanawha Valley Bank Bldg., Charleston.

On the Membership Committee of the Association, appointed as of June 1, 1922, are the following: Gallagher, Michael (chairman), general manager, M. A. Hanna & Co., Cleveland. Brewster, T. T., president, Mt. Olive & Staunton Coal Co., St. Louis. Brophy, J. S., president and general manager, Piedmont & George's Creek Coal Co., Frostburg, Md. Clemens, Ira, president, Clemens Coal Co., Pittsburg, Kan. Crewe, L. C., president, LaFollette Coal & Iron Co., LaFollette, Tenn. Donaldson, John A., vice-president, Pittsburgh Coal Co., Pittsburgh. Huff, W. H., president, Victor-American Fuel Co., Denver. Penna, P. H., secretary, Indiana Bituminous Coal Operators' Association, Terre Haute, Ind. Puterbaugh, J. G., president, McAlester Fuel Co., McAlester, Okla. Quealy, P. J., president, Gunn-Quealy Coal Co., Kemmerer, Wyo. Randall, R. M., general manager, Consolidated Coal Co. of Saginaw, Saginaw, Mich. Robbins, S. H., president, Youghiogheny & Ohio Coal Co., Cleveland. Sampson, W. J., president, Witch Hazel Coal Co., Youngstown, Ohio. Wentz, D. B., president, Stonega Coke & Coal Co., Philadelphia. Buchanan, DeWitt, president, Old Ben Coal Corp., Chicago. Calloway, A. W., president, Davis Coal & Coke Co., Philadelphia. Conner, Chas. W., general manager, Elkhorn & Shelby Creek Coal Co., Esco, Ky. Francis, Geo. H., secretary, Keystone Coal & Coke Co., Greensburg, Pa. John, W. H., secretary, Bridgeport Coal Co., Bridgeport, Tex. Lewis, T. L., secretary, New River Coal Operators' Association, Charleston, W. Va. Meehan, H. J., president, Cosgrove & Co., Swank Bldg., Johnstown, Pa.

The Executive Committee of the Association, appointed as of June 1, 1922, is composed of the following: Ogle, A. M. (chairman), president, Vandalia Coal Co., Terre Haute, Ind. Bradley, J. G., president, Elk River Coal & Lumber Co., Dundon, W. Va. Brewster, T. T., president, Mt. Olive & Staunton Coal Co., St. Louis. Gallagher, Michael, general manager, M. A. Hanna & Co., Cleveland, Ohio. Guthrie, T. W., president, Hillman Coal & Coke Co., First Natl. Bank Building, Pittsburgh. Mahan, E. C., president, Southern Coal & Coke Co., Knoxville, Tenn. Penna, P. H., secretary, Indiana Bituminous Coal Operators' Association, Terre Haute, Ind. Taylor, C. W., vice-president, W. G. Duncan Coal Co., Greenville, Ky. Taylor, H. N., vice-president, Central Coal & Coke Co., Kansas City, Mo. Watkins, T. H., president, Pennsylvania Coal & Coke Corp., 910 Whitehall Building, New York City. Wentz, D. B., president, Stonega Coke & Coal Co., Philadelphia, Pa.

Trade Literature

Cut Ash-Handling Costs. Conveyors Corporation of America, Chicago, Ill. Pp. 8; 4 x 8 in.; illustrated. This booklet is an exposition of the steam jet conveyor method of ash handling and contains a description of the conveyor and its method of operation.

Velocity Stage Turbines. De Laval Steam Turbine Co., Trenton, N. J. Catalog C. Pp. 28; 8 x 11 in.; illustrated. Describes a line of velocity and stage turbines especially designed for high pressure and high temperature steam. The turbines are built in sizes up to 1,200 hp.—Advertiser.

Dynamite—The New Aladdin's Lamp. Hercules Powder Co., Wilmington, Del. A 16-page booklet written by T. W. Bacchus, vice-president of the company. An interesting and accurate account of the part played by dynamite in the industrial development of this country.—Advertiser.

Recent Patents

Flotation Apparatus. Arthur W. Fahrenwald, Moscow, Idaho, 1,417,895. May 30, 1922. Filed May 11, 1920; serial No. 380,494.

Collecting Main for Byproduct Coke Ovens. Wm. H. Pavitt, Jr., Brooklyn, N. Y., assignor of one-third to Louis Wilputte and two-thirds to Alice Wilputte, New Rochelle, N. Y., 1,414,524. May 2, 1922. Filed Jan. 19, 1920; serial No. 352,478.

Hopper for Use in Feeding Finely Divided Fuel. James Fisher, New Orleans, La., 1,414,870. May 2, 1922. Filed April 14, 1921; serial No. 461,357.

Mining Apparatus. Edward L. Hopkins, Columbus, Ohio, assignor to the Jeffrey Mfg. Co., Columbus, 1,414,877. May 2, 1922. Filed Oct. 11, 1912; serial No. 725,276. Renewed July 30, 1920; serial No. 300,213.

Means for Closing and Opening Skips. Franz Uhlig, Berlin, Germany, 1,415,066. May 9, 1922. Filed Sept. 14, 1920; serial No. 410,315.

Mine-Skip Loader. Charles L. Lawton, Hancock, Mich., 1,415,181. May 9, 1922. Filed June 8, 1921; serial No. 475,866.

Obituary

Edward J. Conroy, widely known as an authority on fuel and fuel supply and head of the E. J. Conroy Coal Co., died recently in Grand Rapids, Mich. Mr. Conroy had been in the coal business for 16 years.

George L. Rodgers, vice-president and general manager of the Mon-Scott Fuel Co., and treasurer of the Shamrock Fuel Co., of Morgantown, W. Va., died at a hospital in Brownsville, Pa., on Sept. 10. The body was taken to West Alexandria, Pa., for burial. Mr. Rogers was not only an authority on coal mining but was thoroughly conversant with transportation problems, inasmuch as he had been connected with the Monongahela Ry. at Brownsville and with the Pennsylvania as a traffic executive. The esteem in which he was held by men in the coal business was shown when he was made president of the Morganton Coal Club.

Publications Received

An Investigation of the Properties of Smithing Coals. By H. J. Sloman, assistant professor of coal mining, School of Mines, Pennsylvania State College. Bulletin No. 1. Pp. 16; 6 x 9 in.; charts and tables.

Foreign Commerce Handbook.—The Foreign Commerce Department of the Chamber of Commerce of the United States. This publication condenses information as to sources of service in foreign trade. The book contains also a list of the topics of national importance that are engaging the attention of the National Chamber's Foreign Commerce Department Committee.

Map of Producing Coal Districts of the United States. U. S. Geological Survey. Adapted by F. G. Tryon and W. F. McKenney from State maps compiled by C. E. Lesher in 1919.

Annual Report for 1921 on the Mines in the Province of Nova Scotia. Department of Public Works and Mines, Halifax, N. S. Pp. 102; 6 x 9 in.; illustrated.

An Investigation of the Properties of Chilled Iron Car Wheels. Part I, Wheel Fit and Static Load Strains. By J. M. Snodgrass and F. H. Guldner. The investigation was conducted by the Engineering Experiment Station of the University of Illinois in co-operation with the Association of Manufacturers of Chilled Iron Car Wheels. Bulletin No. 129. Pp. 101; 6 x 9 in.; illustrated with diagrams and photographs.

The Ignition Temperature of Coal. By Ray W. Arms. Engineering Experiment Station of the University of Illinois, Urbana, Ill. Bulletin 128. Pp. 69; 6 x 9 in.; illustrated with photographs and diagrams. A small fee of 35c. is charged for this bulletin.

Methods for Testing Petroleum Products. Bureau of Mines, Washington, D. C. Technical Paper 298. Pp. 58; 6 x 9 in.; illustrated. Adopted by the Interdepartmental Petroleum Specifications Committee.

The Geology and Coal Resources of Russell County, Virginia. By Chester K. Wentworth. Prepared in co-operation with the U. S. Geological Survey, with a chapter on "The Forests of Russell County, Va.," by J. W. O'Byrne, assisted by the office of the state forester. Bulletin No. XXII. Pp. 179; 7 x 10 in.; illustrated.

Fuel Briquets in 1921—Compiled by W. F. McKenney of the U. S. Geological Survey. Pp. 5; 6 x 9 in.; illustrated. Giving production figures for the world, and statistics on U. S. production of briquets.

University of Montana Bulletin No. 2. The Montana State Bureau of Mines and Metallurgy, State School of Mines, Butte, Mont. Pp. 30; 6 x 9 in. A directory of the metal and coal-mining companies in the State of Montana.

Coming Meetings

Kentucky Mining Institute will hold its annual meeting Nov. 3 and 4 at Seeback Hotel, Louisville, Ky. Secretary, Elizabeth C. Rogers, Lexington, Ky.

The National Industrial Traffic League will hold its annual meeting Nov. 15 and 16 at the Hotel Commodore, New York City. Secretary, J. H. Beek, Chicago, Ill.

Coal Mining Institute of America will meet Dec. 13, 14 and 15 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 911 Chamber of Commerce Bldg., Pittsburgh, Pa.

Alabama Mining Institute will hold its next meeting Oct. 3 at Birmingham, Ala. Secretary, J. L. Davidson, Birmingham, Ala.

American Mining Congress. Twenty-fifth annual convention and exposition of mines and mine equipment will be held at Public Hall, Cleveland, Ohio, Oct. 9-14. Executive offices, the Hollenden Hotel; E. C. Porter, convention manager.

National Exposition of Power and Mechanical Engineering will be held at the Grand Central Palace, New York City, Dec. 7-13. Manager, Charles F. Roth, Grand Central Palace, New York City.

American Gas Association will hold its annual meeting Oct. 23-28 at Atlantic City, N. J. Secretary-Manager Oscar H. Fogg, 130 East 15th Street, New York City.

Canadian Institute of Mining and Metallurgy, annual Western meeting Nov. 15-17, at Vancouver, B. C. Secretary-Treasurer, G. C. Mackenzie, Montreal, Quebec, Can.